KODAK PROFESSIONAL HR
500 Plus and Universal Film Scanners

User's Guide

Part No. 6B7198

Unpacking Instructions for the
KODAK PROFESSIONAL
HR 500 Plus and Universal Film Scanners

CAUTION: **The HR Film Scanner weighs almost 120 lbs (54,5 kg). Two people are needed to safely lift the scanner from the box.**

The table for the scanner must be:

- **stable**
- **able to support approximately 120 lbs (54,5 kg)**
- **at least 30 in. (76,2 cm) long x 30 in. (76,2 cm) wide**

lid

styrofoam

scanner in plastic bag

cutouts

styrofoam under scanner

front compartment with accessories
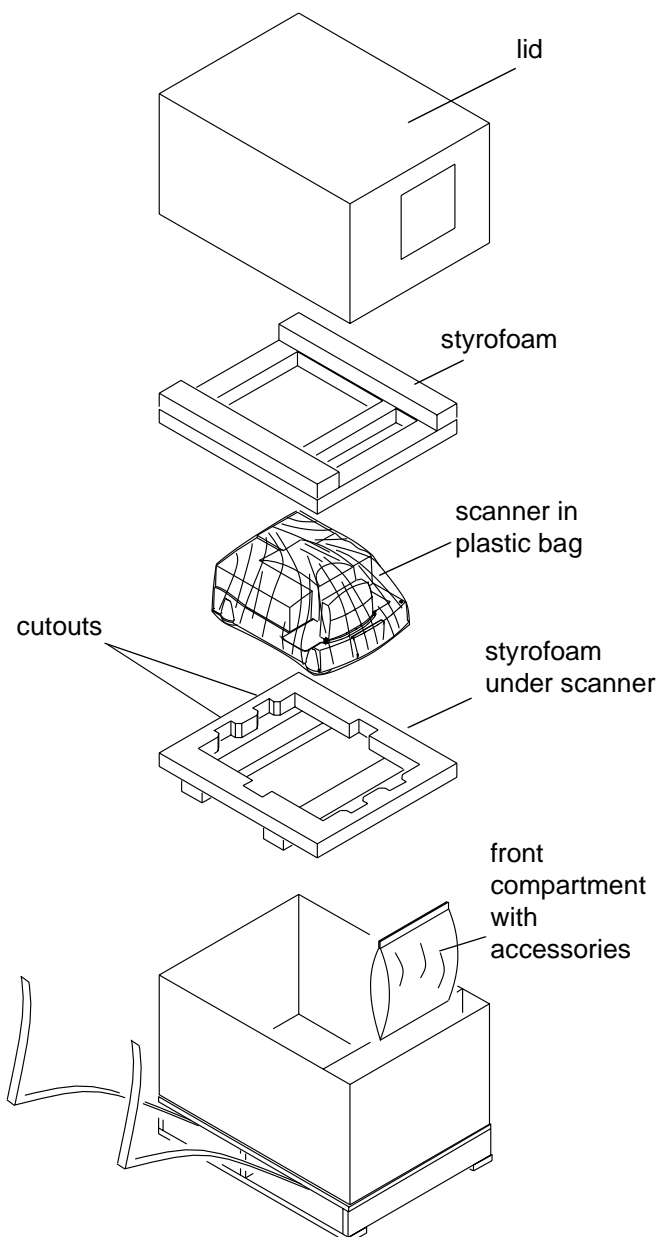
1. Inspect the box to make sure there is no damage.

   If there is damage, contact the shipping company.

2. Remove the lid from the box.

3. Remove the scanner accessories (such as cables and the SCSI board) from the front compartment of the box.

4. Compare the packing list to the contents.

   If there is an item missing:

   - *In the United States:* call Eastman Kodak Company at 1-800-822-1414.
   - *Outside the United States:* contact your local Kodak representative.

5. Open the plastic bag that covers the scanner and move the bag to reach the cutouts in the styrofoam under the scanner.

CAUTION: **Two people are needed to lift the scanner from the box.**

6. Use the styrofoam cutouts to reach under the scanner (one person in front; one person in back) and lift the scanner from the box onto the table.

7. Keep the scanner packing material until you are satisfied that the scanner is operating correctly.

CAUTION: **The setting on the AC input module on the back of the scanner must be compatible with the power source.**

Regulatory Information

This equipment has been tested and found to comply with the limits for a Class A device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference; in which case, the user would be required to incur the expense of correcting the interference.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波障害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

English: This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

Cautionary Symbols

Hot Surface Symbol

CAUTION: Risk of burn. Wait at least 5 minutes for the surface to cool.
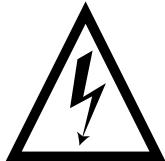
Fuse Label

(2) 100-120 V   50/60 Hz   6.3 A / 250 V / F
(2) 200-240 V   50/60 Hz   3.15 A / 250 V / T

CAUTION: Double pole / neutral fusing.
ATTENTION: Double pôle / fusible sur le neutre.
ACHTUNG: Zweipolige bzw. Neutralleiter - Sicherung!

CAUTION: The scanner uses double pole/neutral fusing.

Electrical Hazard Symbol

French:
Symbole de Danger Électrique

German:
Elektrisches Gefahrensymbol

CAUTION: Risk of electrical shock. Test before touching.

French:
ATTENTION: Danger D' Électrocution. Vérifier avant de toucher.

German:
VORSICHT: Gefahr von elektrischem Schlag. Vor Berührung prüfen.

Mechanical Hazard Symbol

French:
Symbole de Danger Mécanique

German:
Mechanisches Gefahrensymbol

CAUTION: Moving parts. Avoid contact.

French:
ATTENTION: Pièces en mouvement. Ne pas toucher.

German:
VORSICHT: Bewegliche Teile. Nicht berühren.

Warranty Information

The following warranty information pertains to equipment that is installed in the United States only. For equipment installed in countries other than the United States, the terms and conditions of the new equipment warranty are provided by the Kodak company in the country in which the sale is finalized, or by a Kodak-appointed distributor in those countries where Kodak does not have direct sales representation.

Warranty Period

Kodak warrants new equipment to function properly for 90 days from the date of initial installation. This warranty covers the purchaser of the equipment as well as anyone else who owns it during the warranty period.

Warranty Repair Coverage

If this equipment does not function properly during the warranty period, a Service and Support Field Engineer from Kodak will repair the equipment without charge during Kodak's normal working hours (usually 8:00 a.m. to 5:00 p.m., Monday through Friday). Such repair service will include any adjustments and/or replacement of parts required to maintain your equipment in good working order. Supply items are billed as required.

How to Obtain Service

Before you call, please know your scanner's K-Number. The K-Number label is attached to the front of the scanner chassis near the filter and lamp; lift the lamp-and-filter-access door to see the K-number (see *Front View* on page 1-4).

For service and support:

- *In the United States:* call Eastman Kodak Company at 1-800-822-1414.
- *Outside the United States:* contact your local Kodak representative.

Limitations

Warranty service is limited to areas within Kodak's established marketing centers in the contiguous United States, the island of Oahu in Hawaii, and some areas of Alaska.

This warranty does not cover circumstances beyond Kodak's control; it does not cover service or parts for any attachments, accessories, or alterations not marketed by Kodak, nor to correct problems resulting from their use.

Damage caused by failure to meet the electrical specification in this manual is not covered under the warranty to service agreement claim.

Kodak makes no other warranties, express, implied, or of merchantability, for this equipment.

Repair or replacement without charge is Kodak's only obligation under this warranty. Kodak will not be responsible for any consequential or incidental damages resulting from the sale, use, or improper functioning of this equipment, even if loss or damage is caused by the negligence or the fault of Kodak.

Such damages, for which Kodak is not responsible, include, but are not limited to, loss of revenue or profit, downtime costs, loss of use of the equipment, cost of any substitute equipment, and facilities or services of claims of your customers for such damages.

This limitation of liability does not apply to claims for injury to persons or damage to property caused by the sole negligence or fault of Kodak or by persons under its direction or control.

Kodak Service Agreements

For information on Kodak service agreements:

In the United States: call Kodak's Service Marketing Contract Administration and Billing Support at 1-800-645-6325.

Outside the United States: contact your local Kodak representative.

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About This Guide

This *User's Guide for the KODAK PROFESSIONAL HR 500 Plus Film Scanner and the KODAK PROFESSIONAL HR Universal Scanner* includes procedures for operating, maintaining, and troubleshooting the scanner. It also includes an appendix for the optional Long Roll Accessory.

This guide is intended for personnel who operate the scanner. It assumes you have a basic knowledge of computer operations and film scanners.

Using This Guide

Chapter 1   ***Introduction***—product description, features and benefits, equipment overview, and recommended configuration

Chapter 2   ***Connecting and Operating the Scanner***—connecting the scanner to the host computer, starting up the scanner, preparing to scan an image, performing a scan and shutting down the scanner

Chapter 3   ***Validating the Scanner***—instructions for using the Service and Assembly Module (SAM) and *Adobe PhotoShop* software to validate that the scanner functions properly

Chapter 4   ***Maintaining the Equipment***—procedures to be done by the person in your lab who is responsible for maintenance of the scanner

Appendix A   ***Using the Service and Assembly Module (SAM)***—an overview of using SAM for validating the scanner and for other user functions

Appendix B   ***Ordering Accessories and Supplies***—includes descriptions and order numbers for scanner accessories and supplies

Appendix C   ***Scanner Specifications***—includes space, electrical, and environmental requirements for the scanner

Appendix D   ***Using the Long Roll Accessory***—instructions for installing and using the (optional) Long Roll Accessory with the scanner

1 Introduction and Overview

This chapter includes:

- product description
- features and benefits
- equipment overview
- recommended configuration for host computer
- film sizes

Product Description

With the *Kodak Professional* HR 500 Plus Film Scanner and the *Kodak Professional* HR Universal Film Scanners, you can quickly generate high-resolution digital images from photographic negatives and positives.

You can digitally capture images and store them in files up to 128 MB (format dependent) in size. The scanner is capable of variable magnifications from 0.5 to 2.0.

The new DIGITAL ICE technology corrects blemishes and defects on negatives and reduces your post-print retouching time.

With the HR 500 Plus Film Scanner, you can use films ranging from 35 mm to 70 mm widths, including 46 mm width film and the 120 series formats, with up to 90 mm frame lengths.

With the HR Universal Scanner, you can use all film formats, from 35 mm to 70 mm widths, including 46 mm width film, the 120 series formats, and 4 x 5 sheet film, with up to 125 mm frame lengths.

How the Scanner Works

The image on the film is focused onto a Charged Coupled Device (CCD) that has three parallel linear rows of light-sensitive elements, one row for each color. Each of these lines is exposed to a corresponding line of image on the film. The time to expose each line properly is controlled electronically and is a function of the:

- sensitivity of the CCD
- amount and spectral distribution of light from the light source
- lens aperture
- magnification factor

After the exposure, the data from the photosensitive sites on the CCD is transferred to readout registers for each line, where it is then shifted out and digitized one pixel at a time. While the data is shifted out, the next set of lines is exposed.

The film is moved to expose a new line of the image for each set of lines read from the CCD. This motion is precisely controlled to ensure that the aspect ratio of the image is not changed and that the colors align correctly when the data is recombined to correct for the distance between the sensor rows.

Features and Benefits

Features and benefits of the HR 500 Plus and Universal Film Scanners include:

- high speed and high image quality digital capture
- handling of cut negatives, mounted slides, strips, short rolls, and long roll lengths up to 200 feet (61 meters)
- compatibility with familiar software, such as
  - *Kodak Professional* Digital Print Production Software (DP2)
  - *Kodak Professional* HR 500 TWAIN Data Source, which can be used with any TWAIN-compliant program
- compatibility with familiar hardware, such as *Kodak Professional* Digital Multiprinters and *Kodak Professional* LED Printers
- the new DIGITAL ICE technology that corrects blemishes and defects on negatives and reduces your post-print retouching time
- the ability to store calibrations, resulting in improved workflow

Before You Begin

It is important that you know when to calibrate and when to focus the scanner. The table below is a guideline for calibrating and focusing. Focusing can occur as infrequently as when a different film format is scanned or as frequently as every scan.
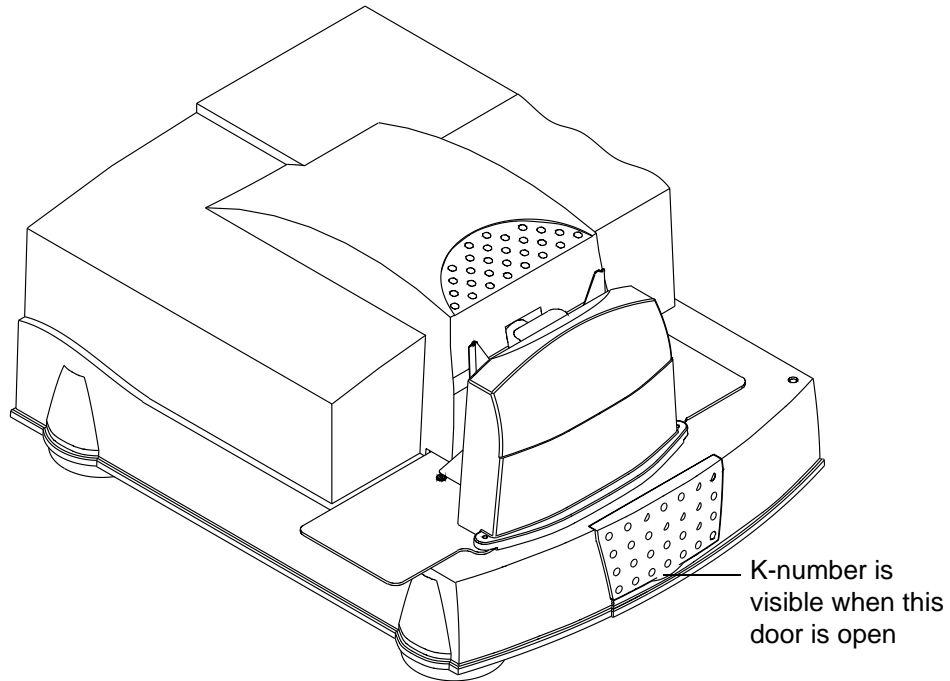
Action or Condition	*Need to Calibrate?*	*Need to Focus?*
Changing the magnification	Yes*	Yes
Replacing the lamp	Yes	No
Changing the balance filter position from negative to positive or from positive to negative	Yes	Yes
The scanner has not been calibrated at least twice during the first half of a production shift	Yes*	No
Cleaning the light bar	Yes	No
Replacing the balance filters or the IR filter	Yes	No
Changing the film holder size without changing the magnification	Yes*	Operator Preference
Scanning slides and aperture cards	No	Operator Preference
Changing from scanning a long roll to scanning a cut negative	Yes	Yes

* The need to calibrate partially depends on whether you are using stored calibrations and the length of time the calibrations are stored (usually about 3 hours)
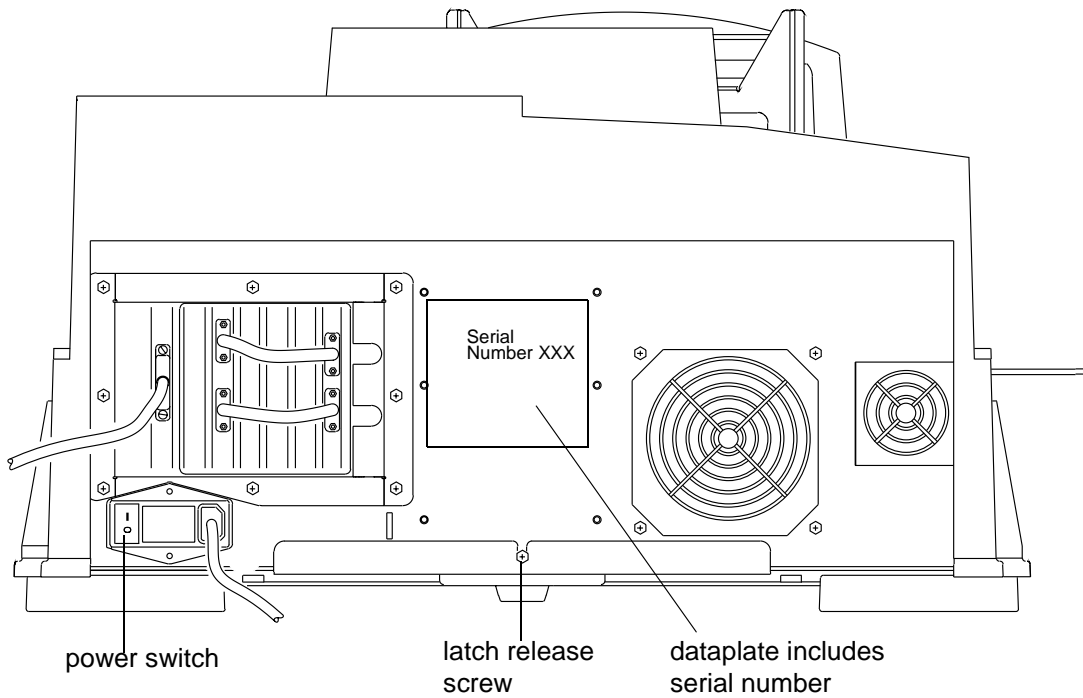
You can manipulate scanned images using a program such as the *Kodak Professional* Digital Print Production Software (DP2) or the *Kodak Professional* HR 500 TWAIN Data Source before sending the images to your digital printer.

Equipment Overview

Front View

K-number is visible when this door is open

Rear View

power switch

latch release screw

dataplate includes serial number

Serial Number XXX

Recommended Configuration of the Host Computer

The scanner is only certified to communicate with *Windows* NT and *Windows* 2000 platforms with the following configuration.

IMPORTANT: *To ensure proper operation of the scanner, use the Ultra-Wide SCSI board provided with the scanner.*

Built-in SCSI interfaces in some computers may interfere with the provided Ultra-Wide SCSI board.

Host Computer Hardware Requirements

A SCSI cable connects the host computer to the scanner. This interface enables the transfer of digital image data from the scanner to the host computer.

If you follow the recommended host computer hardware requirements, you can expect higher performance.

IMPORTANT: *The SCSI board must be dedicated to running only the HR Film Scanner.*

Minimum	Recommended
Dual Pentium III/600 MHz	Dual Pentium III or IV/1.2 GHz
512 MB memory	1 GB memory
10 GB available disk space	40 – 60 GB available disk space
CD-ROM drive	
19- to 21-inch Color Monitor	
24-bit Color Display Card with at least 16 MB video RAM	
Dedicated SCSI host adapter (provided with scanner)	
High-speed internet connection	

Recommended Software Requirements

- *Windows* NT 4.0 or *Windows* 2000, Service Pack 6 or 6A for using the scanner and software
- *Microsoft* Internet Explorer 5.01 or higher
- *Adobe Photoshop* 5.5 or higher for validating operation of the scanner

Film Sizes

Commonly available color negative, color reversal (positive), and black-and-white films are supported by the scanner.

Both the HR 500 Plus Film Scanner and the HR Universal Scanner accept these film sizes:

- 35 mm
  - standard perforated format
  - un-perforated, up to 60 mm frame length
- 46 mm, up to 90 mm frame length
- 120/220 (62 mm)
  - 6 x 4.5 cm
  - 6 x 6 cm
  - 6 x 7 cm
  - 6 x 8 cm
  - 6 x 9 cm
- 70 mm
  - split 70 mm
  - full 70 mm

Additionally, the HR Universal Scanner accepts 4 x 5-in. sheet film.

Film Holders Provided with the Scanner

Cut-gate film holders for these film sizes are provided with the scanner:

- 35 mm double-perforated
- 35 mm mounted slides
- 70 mm-CAL with the HR 500 Plus Film Scanner
- 4 x 5 with the HR Universal Film Scanner
- 6 x 4.5 cm vertical
- 6 x 4.5 cm horizontal
- 6 x 6 cm
- 6 x 7 cm
- 6 x 9 cm

2 Connecting and Operating the Scanner

This chapter gives instructions for:

- preparing the host computer
- connecting the HR Film Scanner to the host computer
- starting up the scanner system
- preparing to scan an image
- performing a scan
- shutting down the scanner

Preparing the Host Computer

CAUTION: Do not connect power to the scanner.

1. Install the Ultra-Wide SCSI board into the host computer.

   IMPORTANT: Check the README file on the CD before you install the software.

2. Install the SAM software. See *Installing the Service and Assembly Module (SAM) Software* on page A-2.

Connecting the Scanner

CAUTION: Make sure the setting on the AC input module on the back of the scanner agrees with the power source.
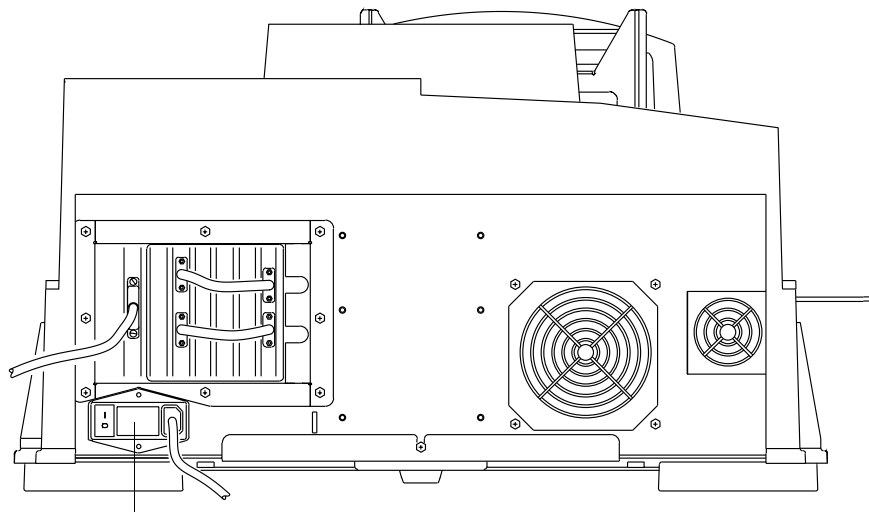
AC input module

The AC input module is factory-set to 115 V AC (60 Hz) as labeled. The accessories shipped with your scanner include two 220 V fuses (3.15 amps) to convert the scanner to 220 V operation.

If your power source is 220 or 230 V AC, verify the configuration of the AC input module. In some regions, the setting and the fuses may have been changed for you. If not, follow the procedure for *Changing the AC Input Voltage Setting and the Fuses.*

Remove the voltage sticker from the AC input module.

Changing the AC Input Voltage Setting and the Fuses

If needed, change the AC input voltage setting (voltage selector switch) and both fuses from 115 V AC to 220 V AC operation:

1. Make sure the power cord is removed from the scanner.

locking tab

voltage selector switch
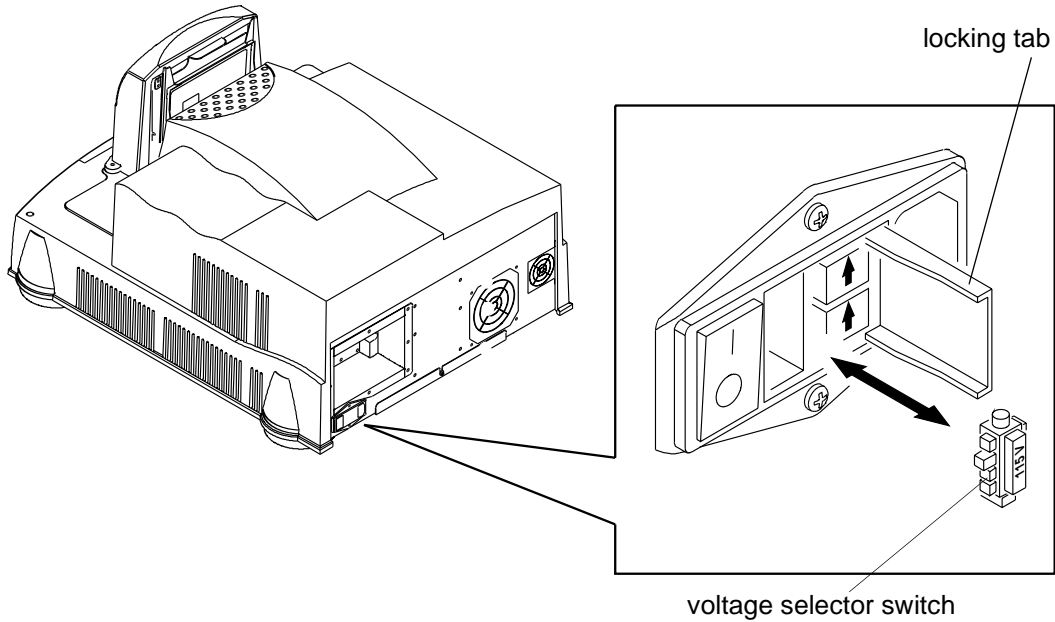
2. Insert a straight-blade screwdriver into the locking tab to open the AC input module.

3. Using your fingers (or, if needed, needle-nose pliers), remove the voltage selector switch.

4. Orient the voltage selector switch with 220 V AC facing you and insert it into the AC input module.

5. Remove the two 115 V AC (6.3 amp) fuses and replace them with the 220 V AC (3.15 amp) fuses. Make sure the arrows are pointing up.

fuse

arrow

fuse in holder
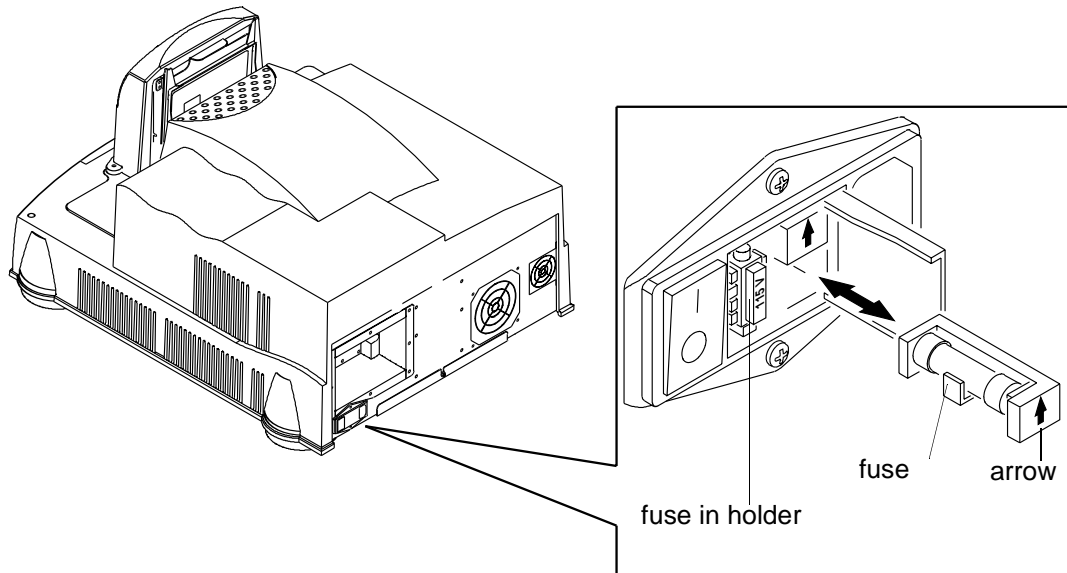
6. Close the AC input module.

Attaching the Cables

CAUTION: **In the next step, avoid forcing the cable pins when plugging the cable into the scanner. You need a straight-blade screwdriver to complete the attachment of the cable to the scanner.**

1. Attach the Ultra-Wide SCSI cable to the scanner and to the host computer. The host end of the cable contains ferrite beads.

2. Attach the power cable from the scanner to the power source.

SCSI cable

power cable

ferrite beads
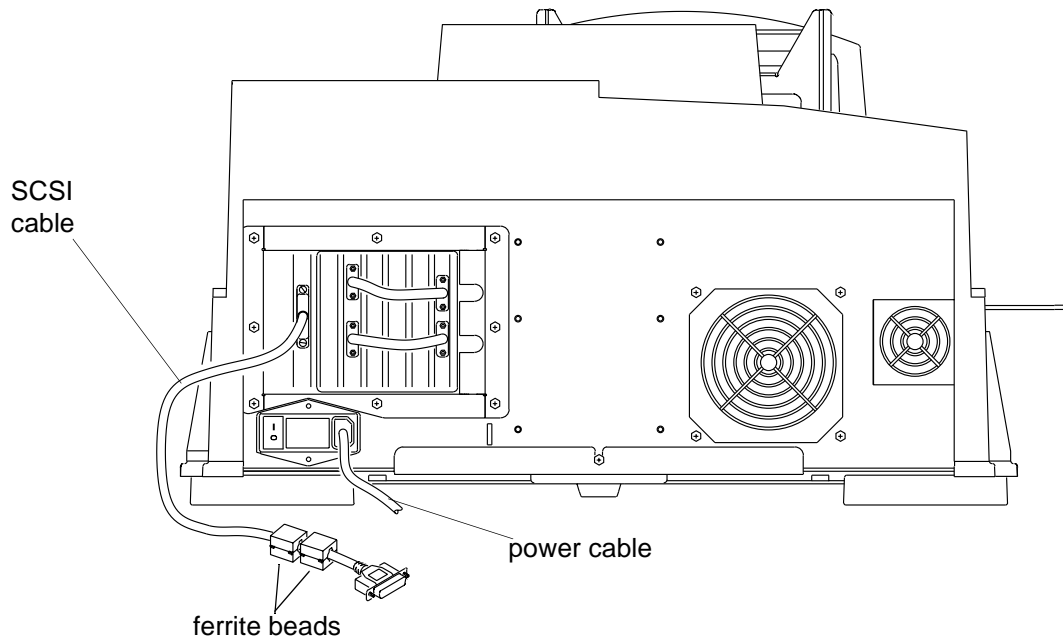
Starting Up the Scanner System

NOTE: If the scanner's power has been on and the scanner has been calibrated, continue with *Operating the Scanner* beginning on page 2-8.

IMPORTANT: *Before operating the scanner in a production environment for the first time, validate that the scanner is working properly. See Chapter 3, Validating the Scanner.*

Placing the Empty Film Holder in the Film Holder Guide

The empty film holder must be in place in the film holder guide when you power up the scanner.

Film Holder for HR 500 Plus Film Scanner	Film Holder for HR Universal Film Scanner
70MM-CAL	4 x 5

edge of handle facing back of scanner

70MM-CAL film holder
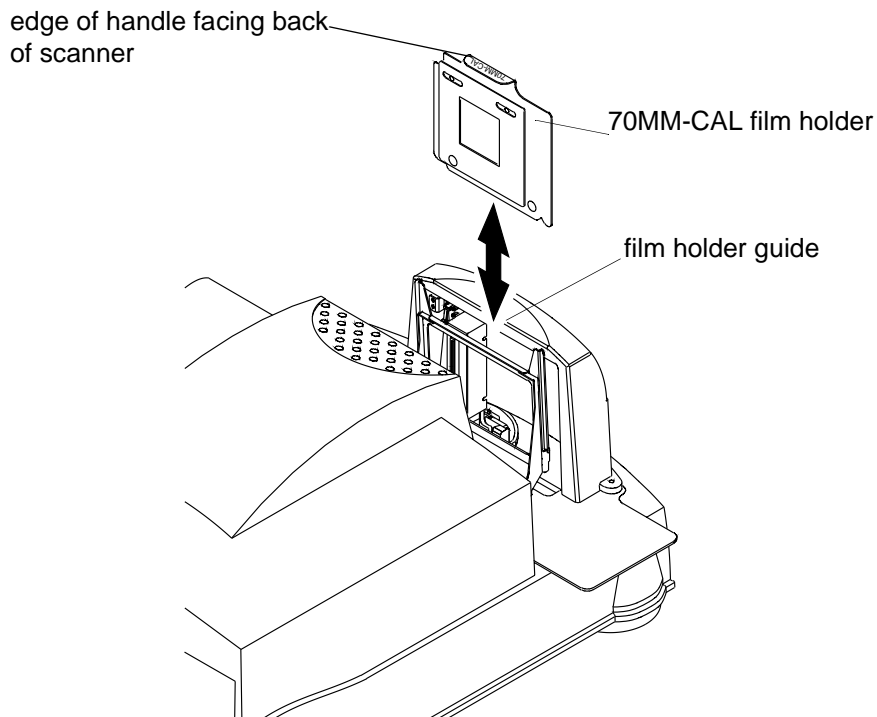
film holder guide

1. With the edge of the top handle facing the back of the scanner, center the film holder between the two rails of the film holder guide.

2. Lower the film holder and let it gently fall into place in the scanner.

3. With your finger, apply pressure to the handle to make sure the film holder is fully seated.

# Powering up the Scanner and the Host Computer

1. Turn on the scanner's power switch.

    NOTE: The green LED light on the scanner indicates only that AC power is supplied to the scanner, not that the system is ready.

    Three sets of beeps will sound (first set: one beep; second set: two short beeps; third set: two short, then one long beep).

    As a visual indicator that the scanner is ready, the scanner lamp lights and remains lit.

2. Turn on power to the host computer and wait until the computer desktop appears.

3. Wait 10 minutes for the lamp to warm up.

power switch
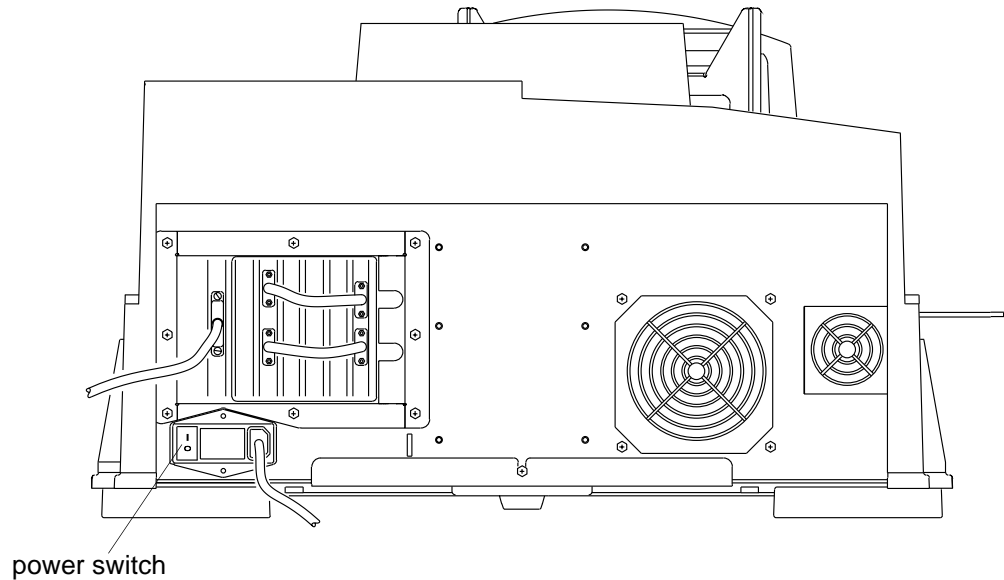
Operating the Scanner

Setting the Magnification and Calibrating the Scanner

Use your host computer's scanner software to do this procedure.

NOTE: The terminology used in your scanner software may differ from that used in this document. Refer to the software manual's instructions for performing specific operations such as calibrating the scanner and setting the magnification.

With the empty film holder (70MM-CAL for HR 500 Plus and 4 x 5 for HR Universal) in place in the scanner:

1. Set the magnification to the desired level.

2. Calibrate the scanner.

Setting the Scan Parameters

Using the software installed on your host computer, set the scan parameters, such as the area to be scanned and the file that will contain the scanned image.

Selecting the Negative or Positive Balancing Filter

lamp-and-filter-access door

lift door open from here
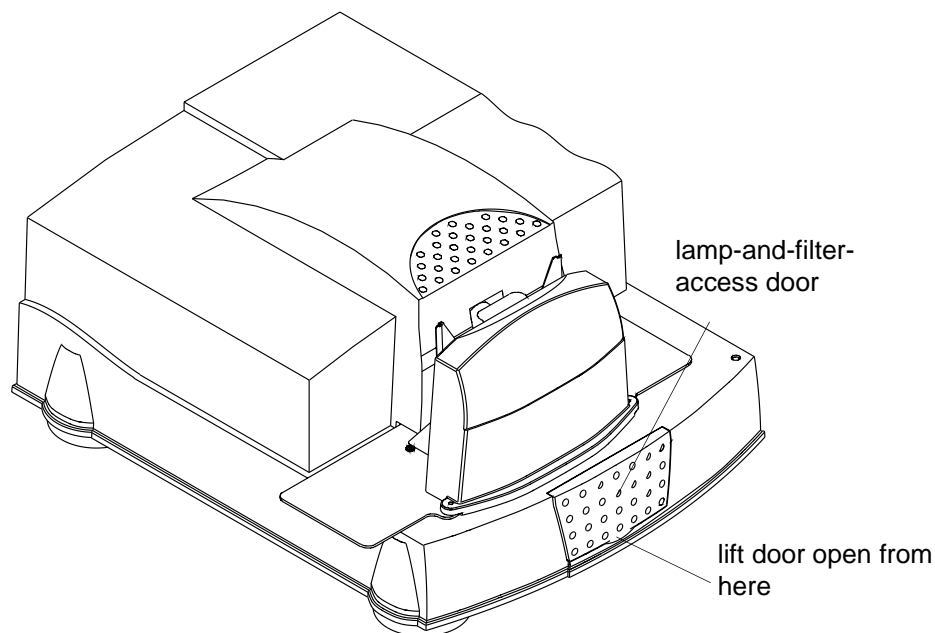
1. Lift open the lamp-and-filter-access door.

2. Make sure the red handle is in the correct position—either negative or positive—for scanning a negative or a mounted slide (positive).

IMPORTANT: If you changed the setting of the balance filter, you must calibrate the scanner before continuing. See Setting the Magnification and Calibrating the Scanner on page 2-8.

red handle is in NEG position
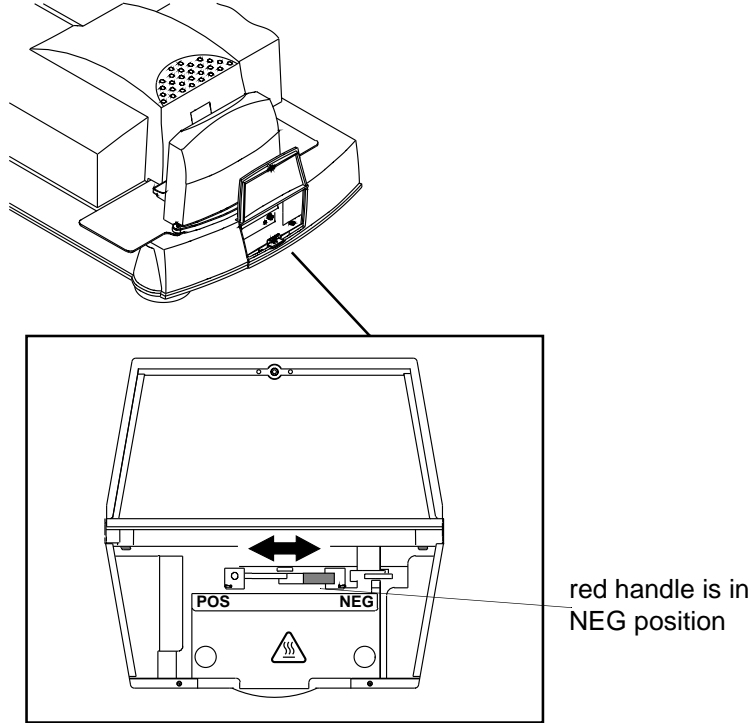
Placing a Negative or Mounted Slide in the Film Holder

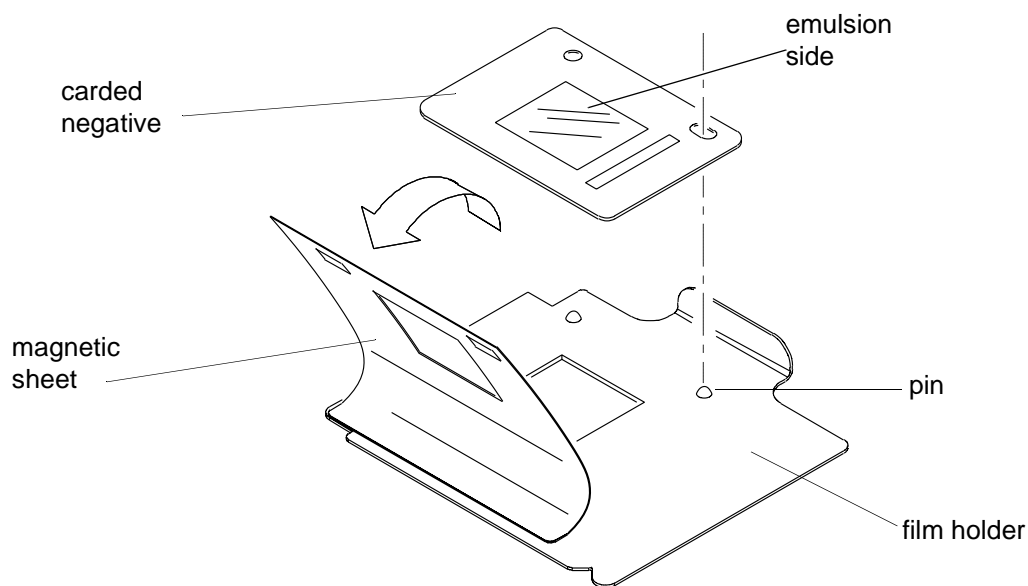Select the appropriate film holder for the negative or mounted slide you will be scanning.

Preparing a Carded Negative

IMPORTANT: *For best focus, use the film holder that is closest to the size of the opening in the aperture card.*

1. Lift the film holder's magnetic sheet.

IMPORTANT: *In the next step, the emulsion side must be toward the rear of the scanner.*

2. With the emulsion side toward the rear of the scanner, locate the carded negative on the film holder's two pins.

3. Carefully close the magnetic sheet over the carded negative.

Preparing an Uncarded Negative

Wear clean, cotton gloves when handling the negative. Illuminate the negative with a light box or hold the negative up to the light to view and align the negative.

1. Identify the emulsion side of the negative.

   The emulsion side is the dull side of the negative. The printing appears backwards.

2. Select either landscape or portrait orientation.

3. Lift the magnetic sheet.

IMPORTANT: In the next step, the emulsion side must be toward the rear of the scanner.

4. With the emulsion side toward the rear of the scanner, carefully align the negative over the rectangular opening in the film holder.

5. Close the magnetic sheet over the negative.

Continue with *Placing the Film Holder in the Scanner* on page 2-12.

Preparing a Mounted Slide

IMPORTANT: In the next step, the emulsion side must be toward the rear of the scanner.

1. With the emulsion side toward the rear of the scanner, align the mounted slide on the film holder between the pins.

2. Carefully insert the mounted slide under the film holder's clamps and into place, keeping the slide aligned.

Placing the Film Holder in the Scanner

1. Hold the film holder guide so the top handle faces the back of the scanner. Center the film holder between the two rails of the film holder guide.

2. Lower the film holder and let it gently fall into place in the scanner.

3. With your finger, apply pressure to the handle to make sure the film holder is fully seated.

edge of handle facing back of scanner

film holder

film holder guide
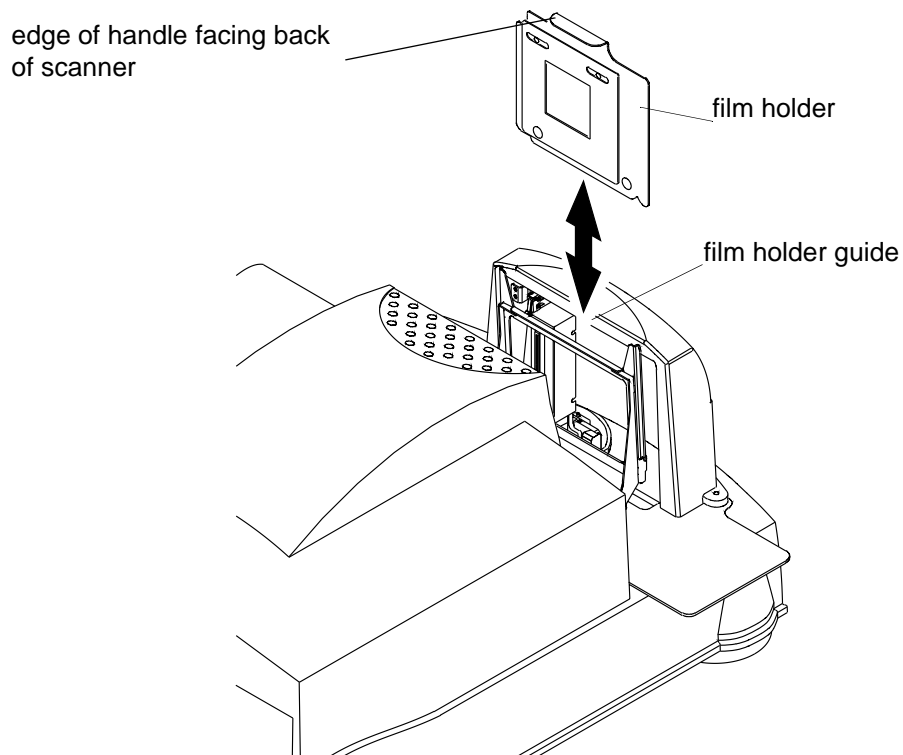
Focusing

With the negative or mounted slide installed in the scanner, use the software installed on your host computer to focus the scanner.

IMPORTANT: *The need for focusing is partially dependent on the "depth of field." When the magnification is lower—for example, 0.5—the depth of field is greater and the focus tolerance is high. As the magnification increases, the depth of field and the focus tolerance decrease. Therefore, it may be necessary to focus more frequently for higher magnifications.*

Scanning a Single Frame

Using the software installed on your host computer, scan the negative or mounted slide.

Shutting Down the Scanner

Follow this procedure when you do not plan to use the scanner for extended periods of time, such as over the weekend.

1. Close the host software program.

2. Turn off power to the scanner.

3 Validating the Scanner

This chapter includes instructions for using the Service and Assembly Module (SAM) and *Adobe Photoshop* software to validate that the scanner functions properly.

NOTES: For more information about using the Service and Assembly module software on the host computer, see *Appendix A*.

Before scanning for the first time, set up a folder (on your host computer) for your work. Especially if you have more than one scanner, include the scanner serial number (on the dataplate on the back of the scanner) in the folder name.

IMPORTANT: *The empty CAL film holder (70MM-CAL for HR 500 Plus Film Scanners and 4 x 5 for HR Universal Film Scanners) must be in position in the scanner before you start SAM. See Placing the Empty Film Holder in the Film Holder Guide on page 2-6.*

Starting the SAM Software

1. Open SAM. The Operations window appears with the Mag/Focus tab displayed.

Operations ✕

| Miscellaneous | Diagnostics | Sensors | Motors & Solenoids | Backup & Restore |
| Mag/Focus | Calibrate/Image Processing | | Capture | Transfer |

Magnification

Chosen Magnification: 1.00 ▼   Do Magnification

Focus

Range: 300   Do AutoFocus

Resulting Position in the Range:

Offset from Center of Range: Focus Quality:

☑ Graph Focus Quality File   Open Focus Quality File

Magnification Calibration

Target Magnification: 1.00   Calculated Magnification:

Start Pixel: 300   End Pixel: 5300

Measured Length: 24.000   ○ Inches
                            ● Millimeters

Calculate Magnification   Update Magnification Table

Graph Magnification Table

● Current   ○ Factory   Graph Magnification Table

2. Perform a backup of the scanner files:

   a. Click the Backup & Restore tab.

   b. Click **Backup**.

Operations   **✕**

Mag/Focus	Calibrate/Image Processing	Capture	Transfer

Miscellaneous	Diagnostics	Sensors	Motors & Solenoids	Backup & Restore

Pressing the Backup button will cause the creation of a backup subdirectory under "C:\HR500 SAM" that will contain two subdirectories, factory and current. Critical files from the scanner will be copied, one at a time, to these directories, overwriting any pre-existing files with the same names.

Restore will copy the same files back to the scanner. If the files don't exist in the subdirectories, the restore will fail. The error will be reported on a file by file basis.

[Backup]   [Restore]

Backup & Restore to/from Specified Location

Folder to Backup to or Restore from:

[   ]   [Browse]

[Backup]   [Restore]

Setting the Magnification

1. Click the Mag/Focus tab.
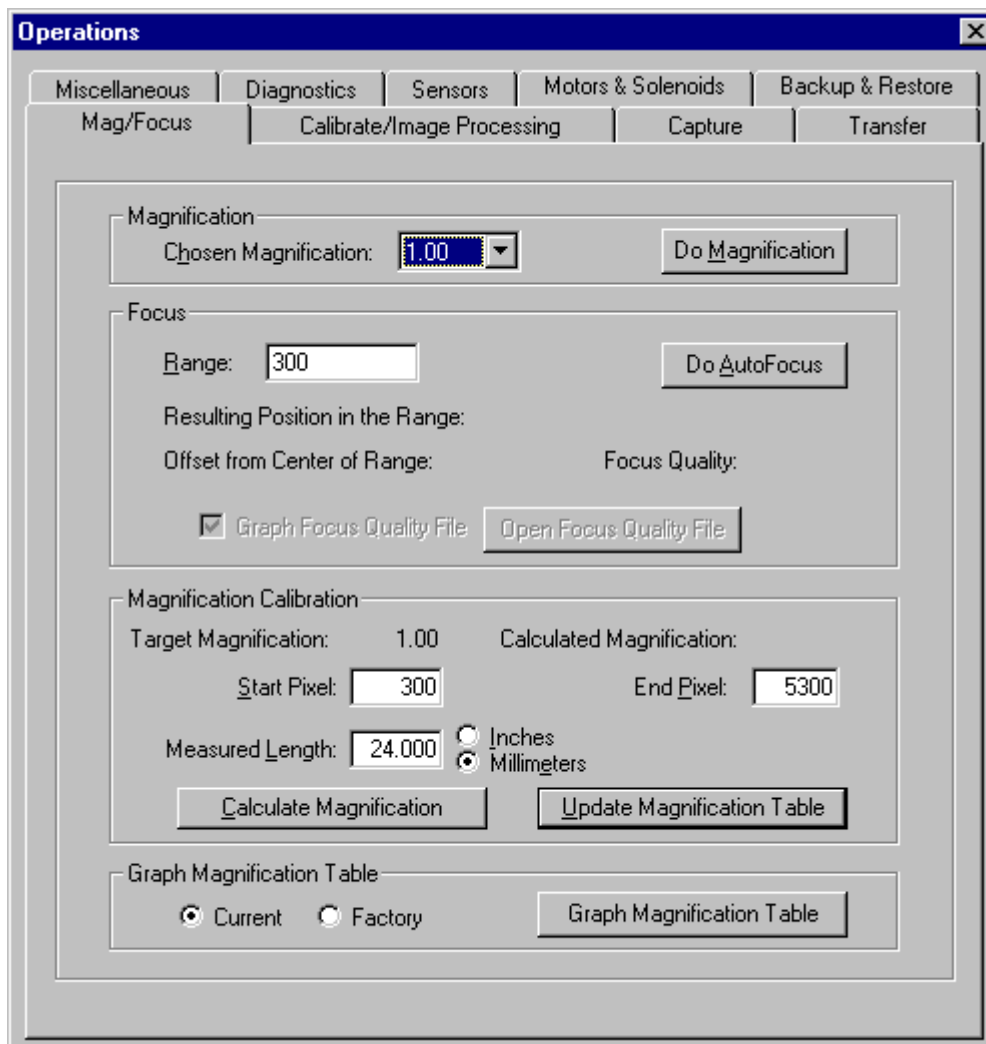
2. Select a **Chosen Magnification** of 1.00.

3. Click **Do Magnification**.

   The lens moves into position.

   A message appears stating that there is no stored calibration.

Calibrating the Scanner

1. Click the Calibrate/Image Processing tab.
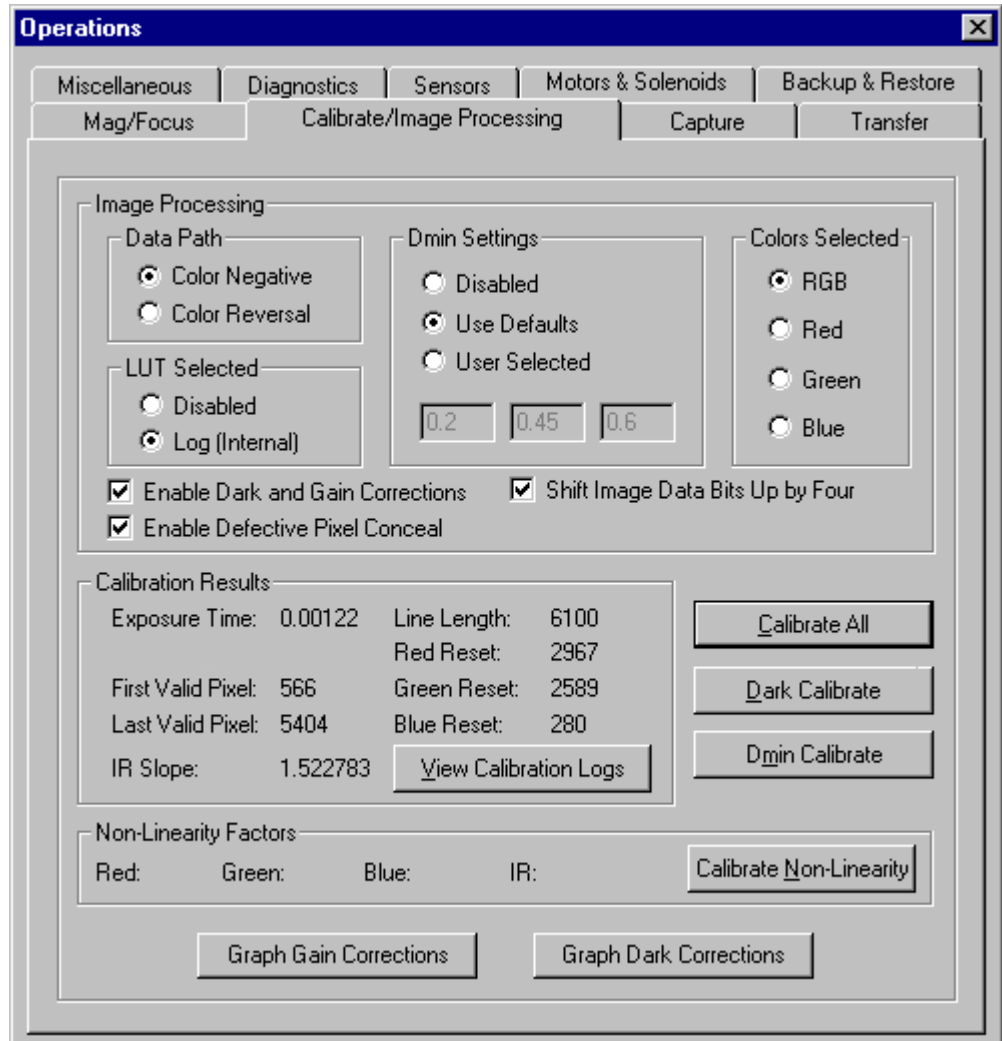
2. For the purposes of validating the scanner, make sure the values on the Calibrate/Image Processing tab match the values shown on the sample. The sample is a representation of the default values.

3. Select **Shift Image Data Bits Up by Four**.

4. Click **Calibrate All**.

Making a Test Scan

Before you scan an image, you must identify the area to be scanned and the file that will contain the scanned image.

1. Click the Capture tab.
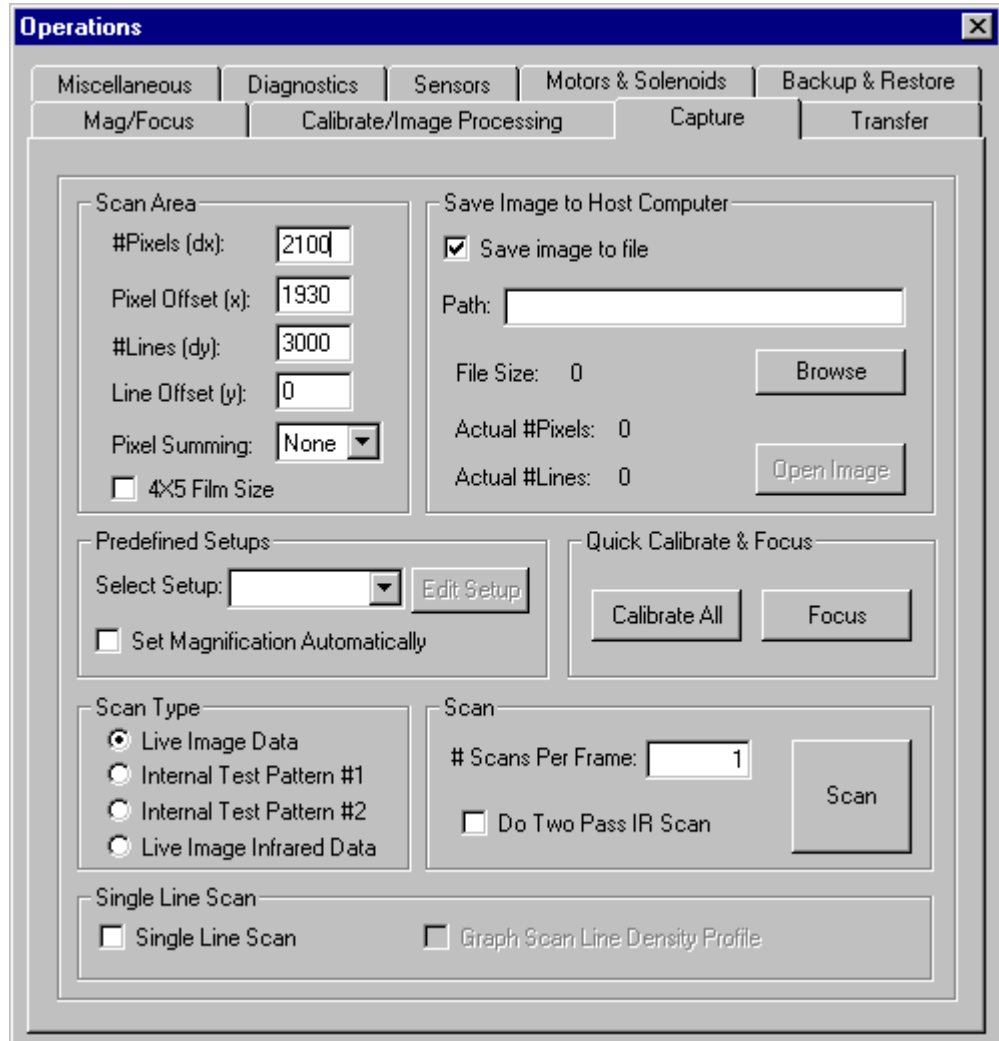
2. Enter the file information:

   a. Select **Save image to file**.

   b. Click **Browse**.

   c. Navigate to the folder for storing your images.

   d. Click **Open** to enter the Path.

3. Use the table below only as a starting point for determining **Scan Area** values.

NOTE: Keep the **Line Offset (y)**: at the default value of 0 and keep **Pixel Summing** at the default value of None.

IMPORTANT: The Pixel Offset must be greater than or equal to the first calibrated pixel and # Pixels must be less than or equal to the last calibrated pixel minus the first calibrated pixel.

Cut-Gate Film Holders	Magnification	# Pixels	Pixel Offset	# Lines	File Size (MB)
35 mm double-perforated	0.50	1033	2484	1460	4.3
	1.03	2129	1936	3008	18.3
	2.00	4133	934	5840	69.1
46 mm	0.50	1754	2123	2554	12.8
	0.60	2105	1948	3065	18.5
	1.58	5542	229	8071	128.0
6 x 4.5 cm vertical	0.50	2368	1816	1539	10.4
	0.66	3126	1437	2031	18.2
	1.26	5967	17	3878	66.2
6 x 4.5 cm horizontal	0.50	1539	2231	2368	10.4
	0.66	2031	1985	3126	18.2
	1.26	3878	1061	5967	66.2
6 x 6 cm	0.50	2368	1816	2250	15.2
	0.55	2605	1698	2475	18.5
	1.26	5967	17	5670	96.8
6 x 7 cm	0.50	2368	1816	2775	18.8
	1.26	5967	17	6994	119.4
6 x 9 cm	0.50	2368	1816	3325	22.5
	1.19	5636	182	7914	127.6
Split 70 mm	0.50	2483	1759	1632	11.6
	0.63	3129	1436	2056	18.4
	1.20	5960	20	3917	66.8
70 mm	0.50	2682	1659	3450	26.5
	1.09	5846	77	7522	125.8
4 x 5 in.	0.50	3972	1014	5026	57.1
	0.74	5878	61	7439	125.1
max mag	2.00	6000	0	7333	125.9
min mag	0.50	2917	1542	3750	31.3

Autofocusing

1. Install a negative or mounted slide in the scanner. (See *Selecting the Negative or Positive Balancing Filter* on page 2-8.)

2. Click the Mag/Focus tab.

3. Click **Do AutoFocus**.

Operations	☒

Miscellaneous | Diagnostics | Sensors | Motors & Solenoids | Backup & Restore
Mag/Focus | Calibrate/Image Processing | Capture | Transfer

Magnification

Chosen Magnification: 1.00 ▼   Do Magnification

Focus

Range: 300   Do AutoFocus

Resulting Position in the Range:

Offset from Center of Range: Focus Quality:

☑ Graph Focus Quality File   Open Focus Quality File

Magnification Calibration

Target Magnification: 1.00   Calculated Magnification:

Start Pixel: 300   End Pixel: 5300

Measured Length: 24.000   ○ Inches
                              ● Millimeters

Calculate Magnification   Update Magnification Table

Graph Magnification Table

● Current   ○ Factory   Graph Magnification Table

Scanning the Image

1. Click the Capture tab.

2. Click **Scan**.

Checking the Scan
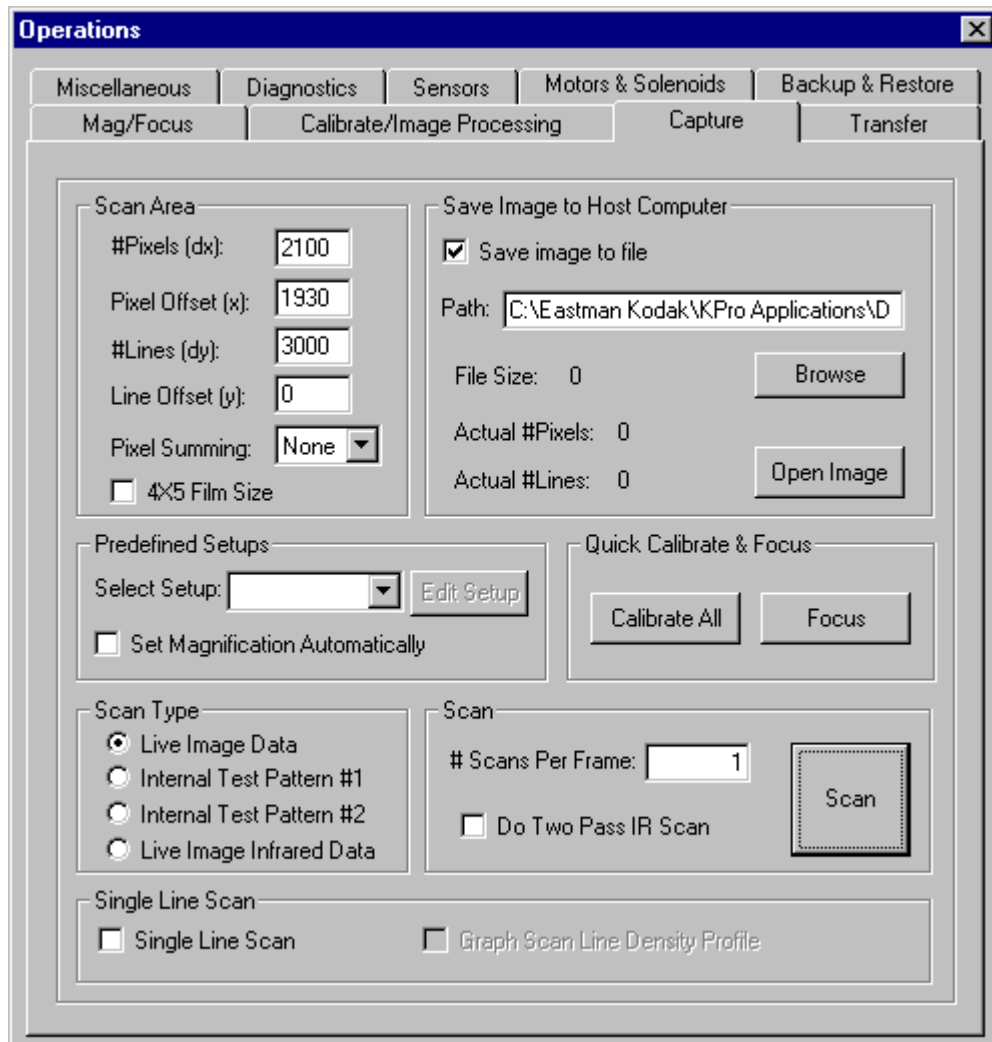
1. On the Capture tab, click **Open Image**.

   Adobe Photoshop opens.

2. In *Photoshop,* enter the required values.

   a. Enter the Dimensions:

   - **Width** = **Actual #Pixels** when **Pixel Summing** is **None**.
   - **Height** = **Actual #Lines** when **Pixel Summing** is **None**.

b. Enter the Channel information:

- Set the **Count** to **3**.
- Make sure **Interleaved** is selected.
- Set **Depth** to **16 Bits**.
- Set **Byte Order** to **IBM PC**.

3. Click **OK**.

After a few seconds, the raw image appears.

4. Select *Image>Adjust>Auto Levels*.

After a few seconds, a clearer image should appear.

5. Select *Image>Rotate Canvas>Flip Vertical*.

NOTE: You may also need to select *Image>Rotate Canvas>90° CCW*.

6. Check that the image appears as you expected.

7. If the image does not appear as you expected, repeat this procedure, making sure you follow the instructions exactly. Then if you still do not get the expected results, contact your Kodak representative.

4 *Maintaining the Equipment*

This chapter contains procedures to be done by the person who is responsible for maintenance of the HR Film Scanners.

Items required for maintenance are:
- Kodak camel's-hair brush (provided)
- dry, untreated microfiber cleaning cloth
- lint-free cloth
- white cotton gloves
- Phillips-head screwdriver

Cleaning Procedures

To minimize the need for cleaning the scanner and to reduce the possibility of artifacts, make sure your scanner is in a clean, low-traffic area that does not collect much dust. Wood, tile, linoleum, or sealed concrete floors are preferable to carpet.

Clean the surface of the scanner with a damp lint-free cloth as needed.

IMPORTANT: *Please read the following before performing any cleaning procedures.*

Avoid using pressurized air or canned air near the scanner.

If it is necessary to use canned air to clean film, direct the air stream away from the scanner.

Instructions for cleaning the balance and IR filters are included under *Replacement Procedures* beginning on page 4-2.

IMPORTANT: *The balance and IR filters are made of glass and are expensive to replace. They are not included in the product warranty or service contract. Use care when handling the balance and IR filters.*

When you remove the filters, inspect them. Cleaning may be all that is required. Otherwise, replace the filters as needed.

Cleaning the Lens

IMPORTANT: *Wear white cotton gloves for this procedure to prevent oils and dirt from being absorbed into the microfiber cleaning cloth.*

1. Use the software installed on your host computer to set the magnification to 2.00, which positions the lens as near to the front of the scanner as possible.

2. Clean the front of the lens with the supplied camel's-hair brush.

3. Check that the lens is clean; if not, clean with a dry, untreated microfiber cleaning cloth.

Cleaning the Light Bar

If artifacts appear on your scanned images, clean the light bar.

IMPORTANT: Wear white cotton gloves for this procedure to prevent oils and dirt from being absorbed into the microfiber cleaning cloth.

1. Fold a dry, untreated microfiber cleaning cloth so the edge of the cloth is about the thickness of the light bar.

   NOTE: You can use an *e-wipe*, manufactured by Photographic Solutions, Inc., instead of a microfiber cleaning cloth.

2. Gently move the edge of the microfiber cloth or *e-wipe* down the length of the light bar one time.

3. Calibrate the scanner.

4. If an artifact remains after cleaning the light bar, check the light bar with a magnifying glass for damage, such as a scratch or a chip. If there is damage to the light bar, contact your Kodak representative for service.

Replacement Procedures

Replacing the Lamp

White cotton gloves are required for this procedure.

One spare lamp is provided with the scanner.

IMPORTANT: Use only the GE ELC Lamp with the HR Film Scanner (see Appendix B: Ordering Accessories and Supplies).

It is not necessary to power down the scanner before changing the lamp.
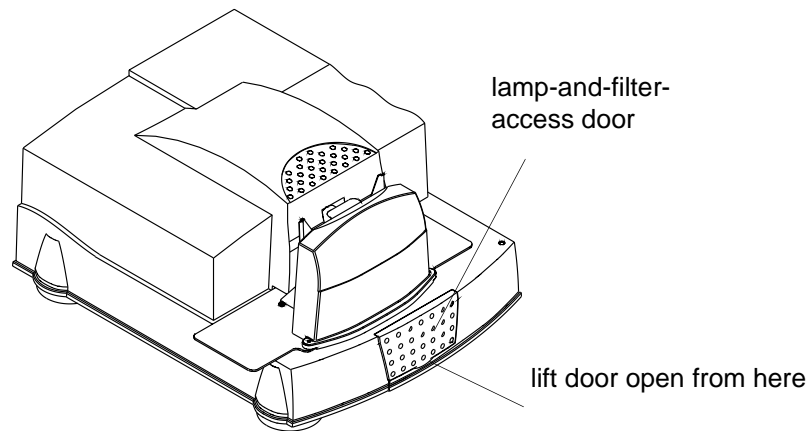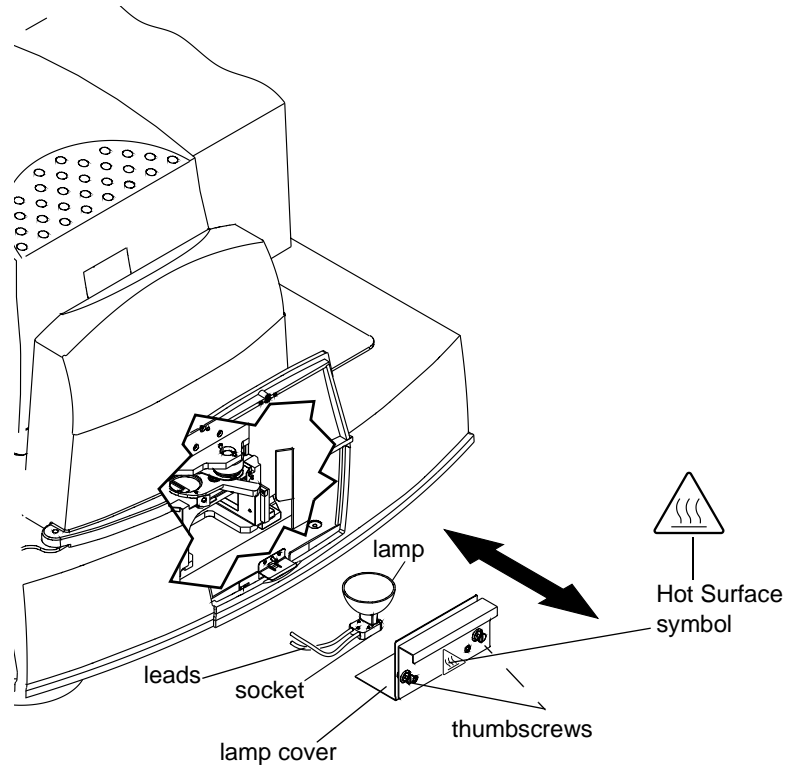
lamp-and-filter-access door

lift door open from here

1. Open the lamp-and-filter-access door.

2. Loosen the thumbscrews on the lamp cover and pull the cover straight out.

   When you remove the cover, the safety switch is released, removing power to the lamp socket.

   CAUTION: Wait at least five minutes for the lamp to cool.

3. Push down the lamp release lever.

4. Remove the old lamp from the lamp socket.

5. Fully seat the new lamp in the socket; polarity is not important.

   CAUTION: In the next step, to ensure correct alignment with the light bar, it is extremely important to push the lamp to the back of the lamp holder with the leads facing to the left. Improper alignment affects the operation of the scanner.

6. With the socket leads facing left, reinstall the lamp in the lamp holder.

7. Reinstall the lamp cover and tighten the thumbscrews.

   Power is reapplied to the lamp socket and the lamp should light.

8. Calibrate the scanner (see *Calibrating the Scanner* on page 3-5).

Replacing the (Round) Balance Filters

IMPORTANT: *The balance filters are made of glass and are expensive to replace. They are not included in the product warranty or service contract. Use care when handling the balance filters.*

Wear white cotton gloves for this procedure.

It is not necessary to power down the scanner before changing the balance filters.

1. Open the lamp-and-filter-access door (see page 4-2 for the location of the lamp-and-filter-access door).
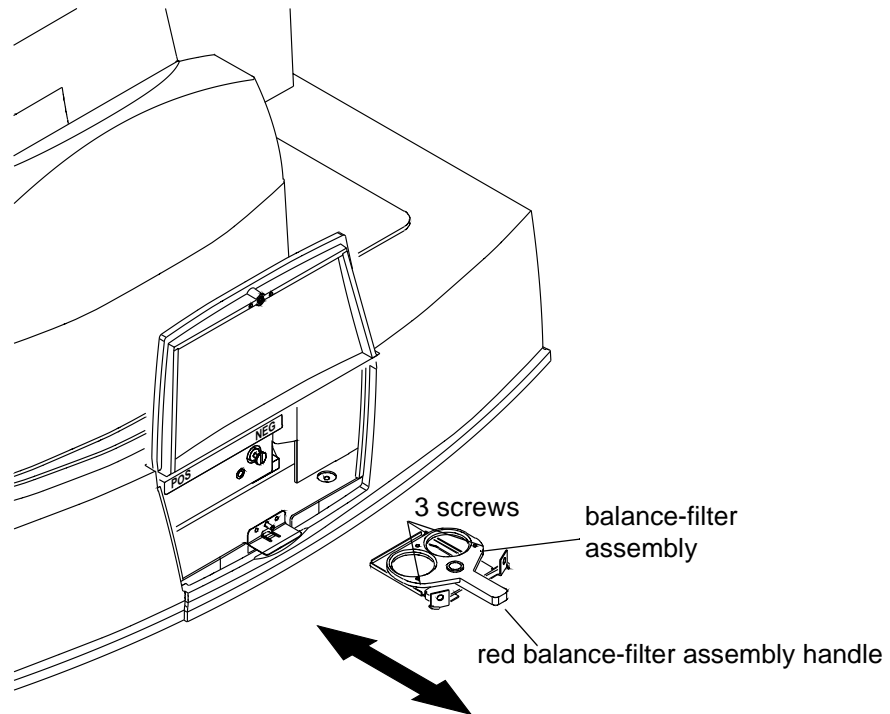
2. Loosen the thumbscrews on the lamp cover and pull the cover straight out.

   When you remove the cover, the safety switch is released, removing power to the lamp socket.

   CAUTION: Wait at least five minutes for the lamp to cool.

3. Position the red balance-filter selection handle of the balance-filter assembly in the center.

   CAUTION: Use care with the IR filter. It is not secured in place. (For more information about the IR filter, see *Replacing the (Square) IR Filter* on page 4-5.)

4. Hold the red handle and pull the assembly straight out from the scanner.

5. Clean the filters with the camel's-hair brush or, if needed, replace the filter(s) as described in the next step.

6. Replace the balance filters:

   a. Remove the 3 screws.

   b. Remove the filter retainer.

   c. Remove the old filters and place the new filters in the filter holder.

      The filters are coated on both sides. It is not important which side faces up or down.

   d. Secure the filters with the retainer and the 3 screws.

7. Install the filter assembly in the scanner with the balance-filter selection handle in the middle.

8. Reinstall the lamp cover, tighten the thumbscrews, and select a filter position.

9. Calibrate the scanner (see *Calibrating the Scanner* on page 3-5).

Replacing the (Square) IR Filter

IMPORTANT: *The IR filter is made of glass and is expensive to replace. It is not included in the product warranty or service contract. Use care when handling the IR filter.*

Wear white cotton gloves for this procedure.

It is not necessary to power down the scanner before changing the IR filter.

1. Open the lamp-and-filter-access door (see page 4-4 for the location of the lamp-and-filter-access door).
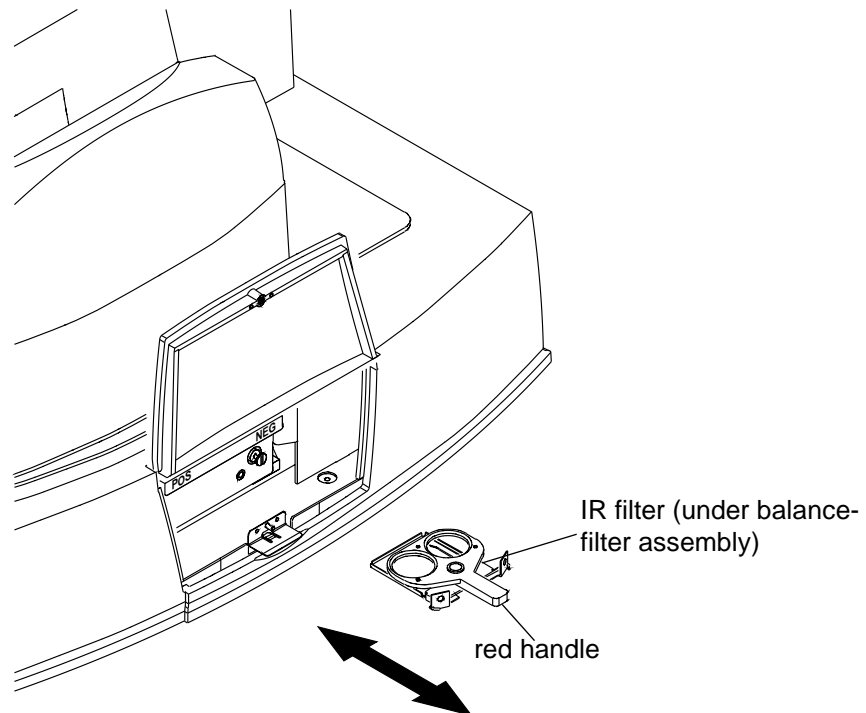
IR filter (under balance-filter assembly)

red handle

2. Loosen the thumbscrews on the lamp cover and pull the cover straight out.

   When you remove the cover, the safety switch is released, removing power to the lamp socket.

CAUTION: Wait at least five minutes for the lamp to cool.

3. Position the red balance-filter selection handle of the balance-filter assembly in the center.

4. Hold the red handle and pull the assembly straight out from the scanner.

5. Push the IR filter up from below the filter assembly.

6. Clean the IR filter with the camel's-hair brush or, if needed, replace the IR filter as described in step 7.

CAUTION: Use care with the IR filter. It is not secured in place.

7. If replacing the IR filter, set the new filter in place with the arrows on the edges of the filter pointing down toward the scan lamp.

8. Install the filter assembly in the scanner with the balance-filter selection handle in the middle.

9. Reinstall the lamp cover, tighten the thumbscrews, and select a filter position.

10. Calibrate the scanner (see *Calibrating the Scanner* on page 3-5).

Appendix A: Using the Service and Assembly Module (SAM)

The Service and Assembly Module (SAM) software performs many of the same functions as other host software. Its primary purpose for users is to validate that your scanner is working correctly and to allow you to perform simple scan functions. There are also service and diagnostics functions that should be used only with the assistance of a Kodak service representative.

Functions supported by the SAM software are:
* setting a magnification
* calibrating the scanner
* setting the image processing mode (negative or positive)
* autofocusing at any given magnification
* defining the area to be scanned
* scanning and transferring images from the scanner to the host computer
* performing miscellaneous features such as:
    – turning the lamp on and off
    – resetting the lamp-on timer
    – rebooting the scanner
    – retrieving scanner usage information
    – displaying software version information
* backing up and restoring critical scanner files

Installing the Service and Assembly Module (SAM) Software

1. Load the SAM CD.

2. Run **setup.exe** from the SAM CD.

3. Respond to the prompts in the installation program.

   You must provide the program location and the name of the program menu item.

4. When installation is complete, reboot your host computer.

5. Remove the CD and store it in a safe place.

Backing Up Scanner Files

IMPORTANT: It is essential that you back up the scanner files before using SAM.

1. Open SAM.

2. From the Operations window, click the Backup & Restore tab.

3. Click **Backup** to back up the critical scanner files.
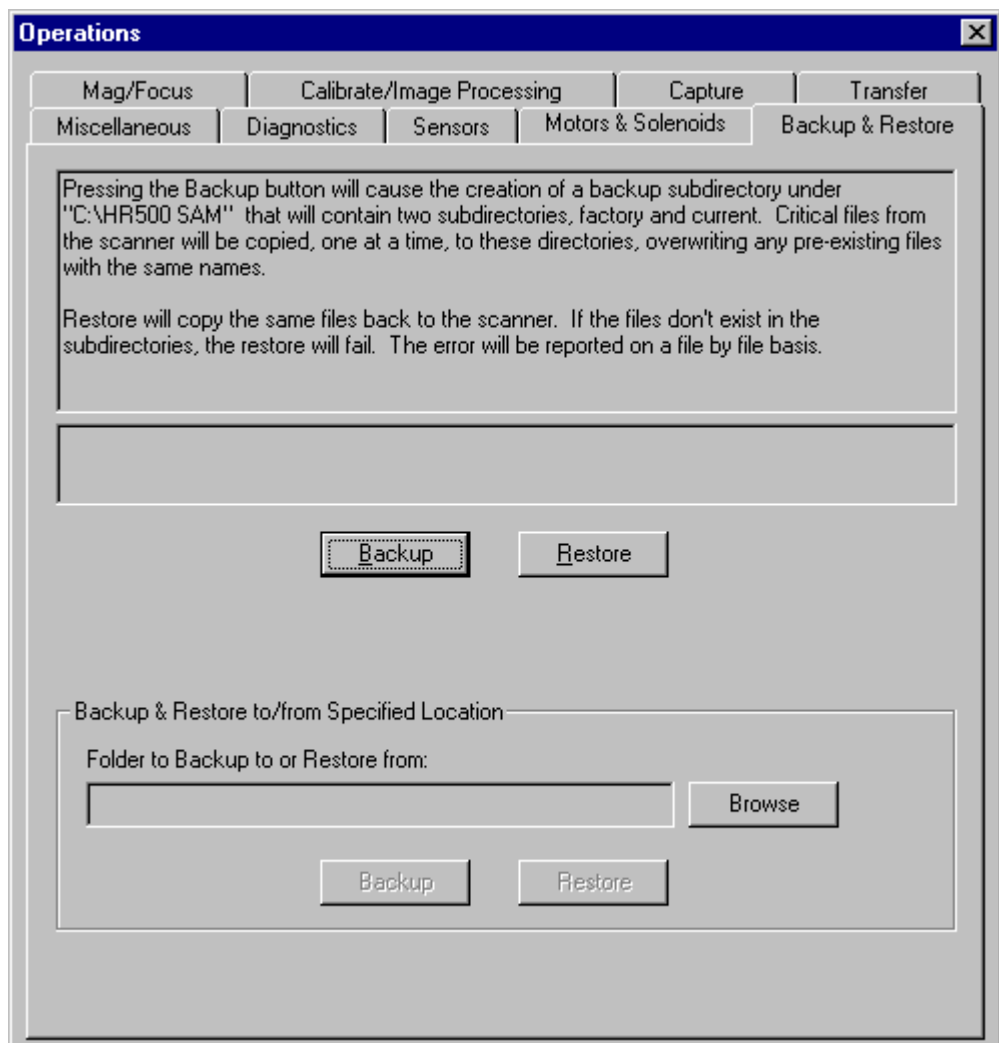
Using Operations

If the Operations window does not appear, select *View->Operations*.
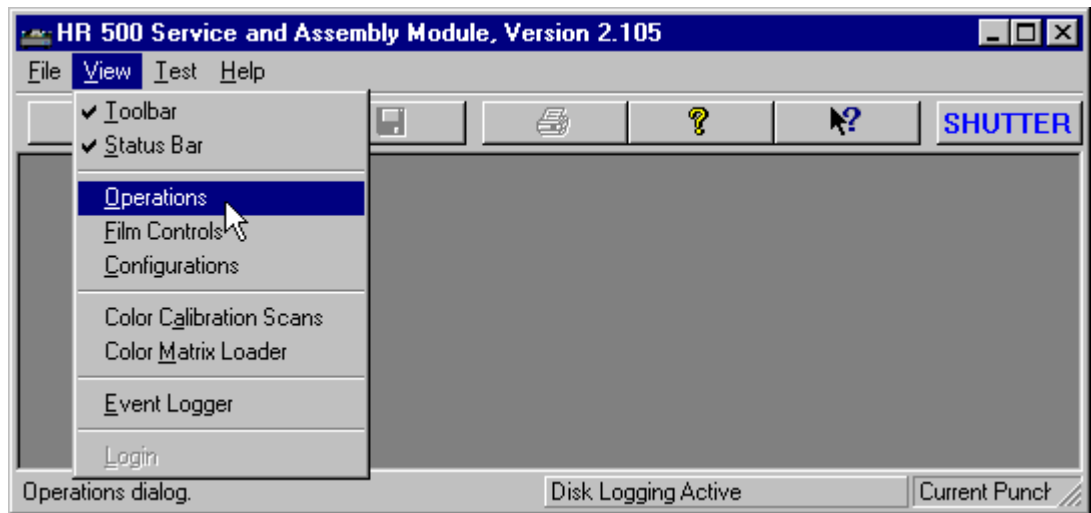
IMPORTANT: The Diagnostics, Sensors, Motors & Solenoids, and Transfer tabs are not needed for user functions. Use these tabs only at the request of your Kodak support representative.
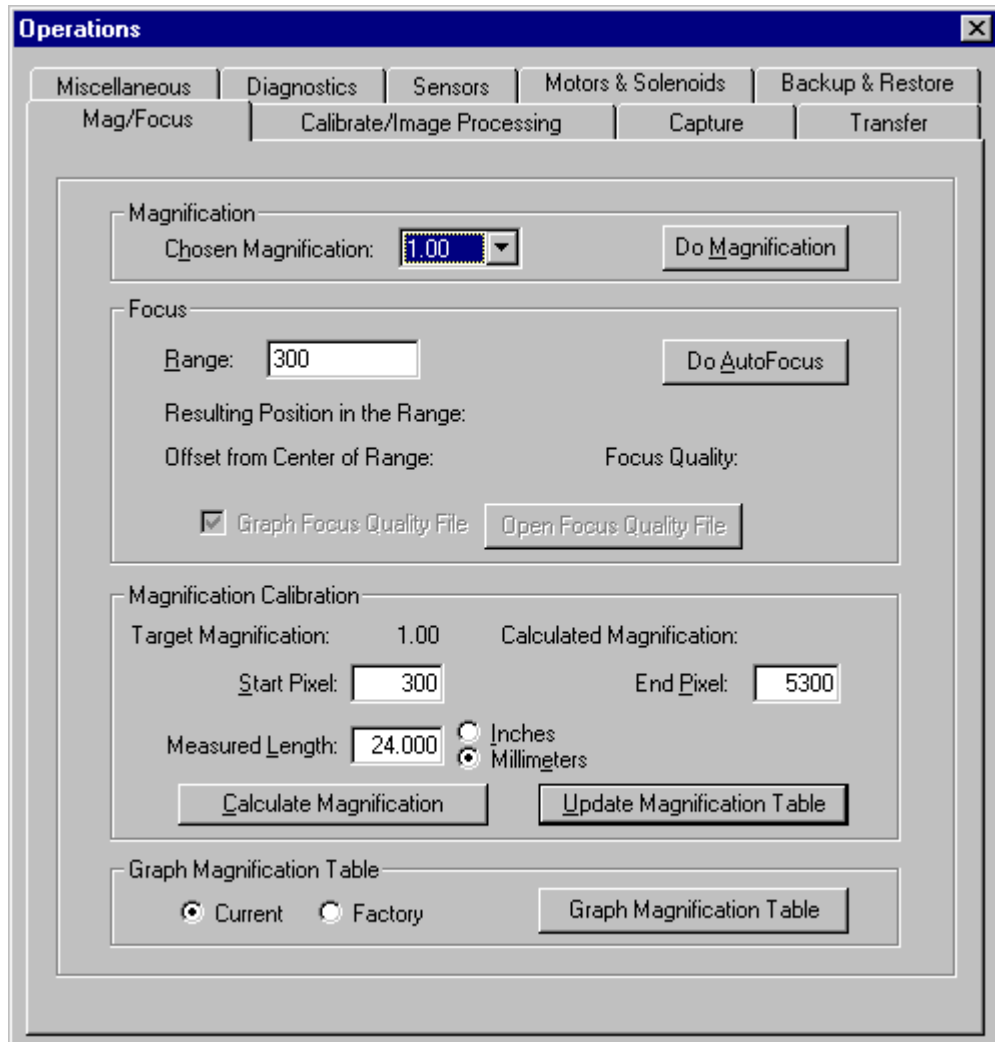
Performing the Functions on the Mag/Focus Tab

IMPORTANT: Magnification Calibration should be done only with the guidance of a Kodak support representative.

From the Operations window, click the Mag/Focus tab when you need to set the magnification (position of the lens) or do an autofocus.
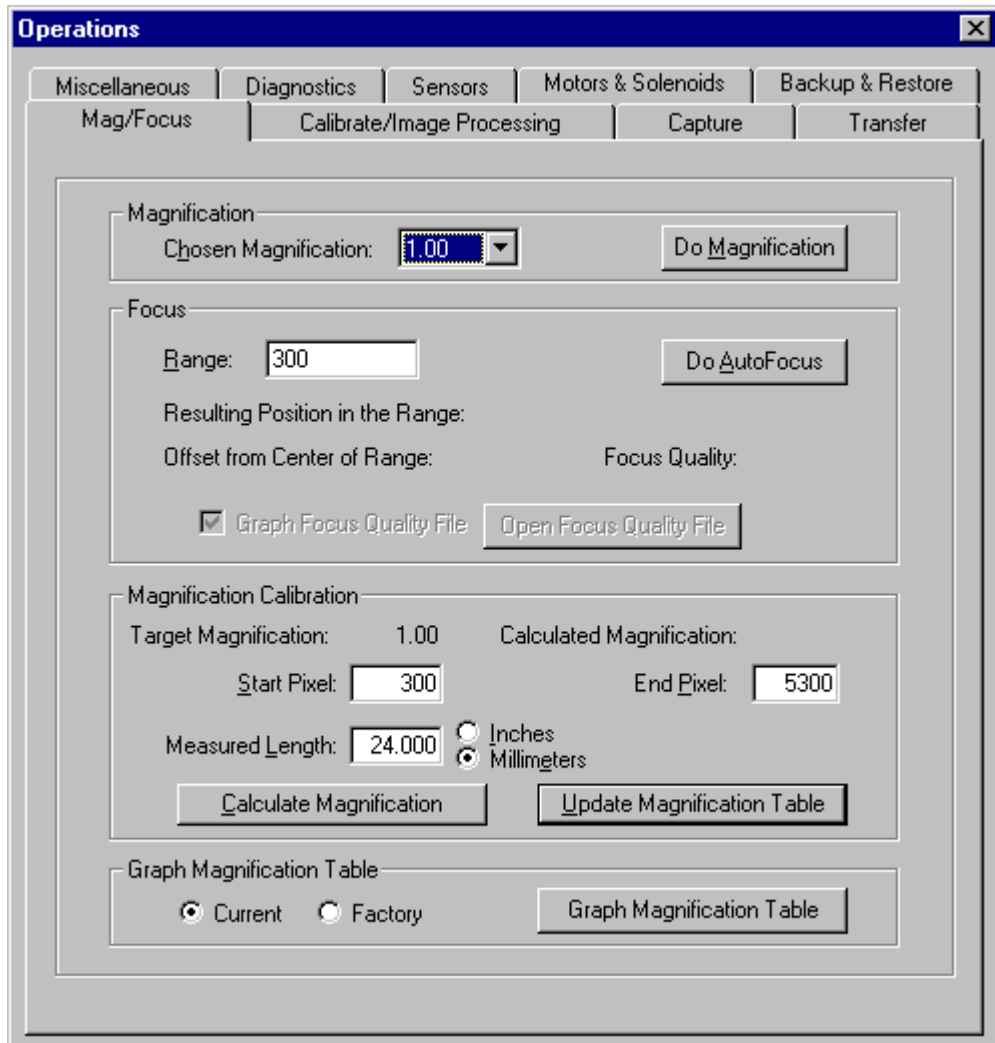
Setting the Magnification

1. On the Mag/Focus tab, select the **Chosen Magnification**. The value can be between 0.5 and 2.0.

   The scanner's software maintains an internal Mag/Focus position table that associates a motor position for each of the possible magnification values.

2. Click **Do Magnification**.

   The lens and CCD move to the chosen position.

Performing an Autofocus

1. On the Mag/Focus tab, enter the Focus **Range**. The recommended value is 300. The Range is the initial range of travel used for the CCD and lens, in motor steps.

   NOTE: To make the focus procedure faster: if you have focused on a given magnification, you can set the Range value to be less than 300.

   IMPORTANT: Autofocus will be done for the Chosen Magnification. It is assumed that when you do an Autofocus, you have:
   - *calibrated with an empty film holder (see Calibrating the Scanner on page A-8)*
   - *placed the film to be scanned in the scanner (see Placing the Film Holder in the Scanner on page 2-12)*
   - *set the scan area (see "Using the Capture Tab" on page A-8); for fastest scanning, set the # of pixels (in the Scan area) to 1000*

2. Click **Do AutoFocus**.

Performing the Functions on the Calibrate/Image Processing Tab

From the Operations window, click the Calibrate/Image Processing tab when you need to calibrate the scanner.
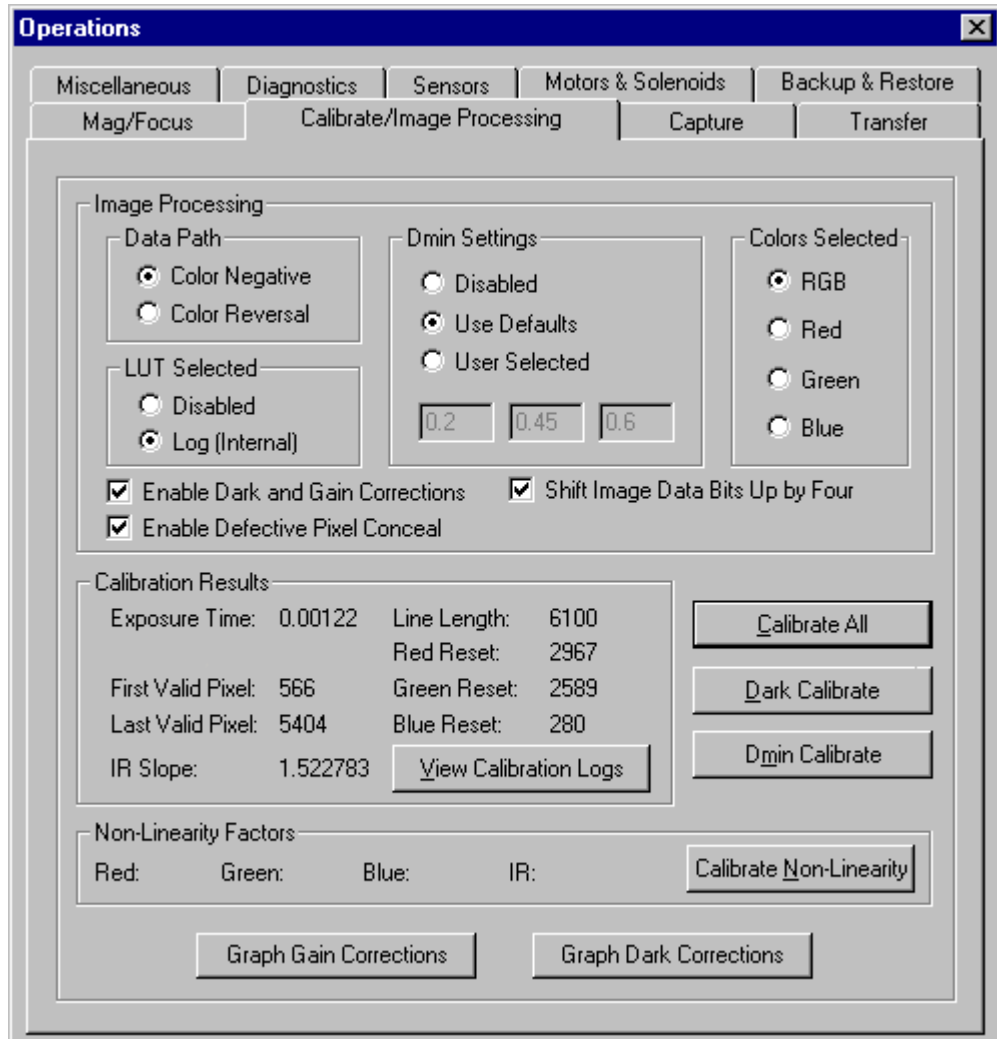
Setting Image Processing Parameters

1. Select the **Data Path**.

2. Select the **LUT Selected**.

3. Select the **Dmin Settings**.

4. Select the **Colors Selected**.

5. Select:

   • **Enable Dark and Gain Corrections**
   • **Enable Defective Pixel Conceal**
   • **Shift Image Data Bits Up by Four**

Calibrating the Scanner

IMPORTANT: The CAL (70MM-CAL for HR 500 Plus Film Scanner and 4 x 5 for HR Universal Film Scanner) film holder must be in position in the scanner before you continue. See Placing the Empty Film Holder in the Film Holder Guide on page 2-6.

1. If the values on the Calibrate/Image Processing tab do not match the values shown on the sample on page A-7, change them. The sample is a representation of the default values.

2. Select **Shift Image Data Bits Up by Four**.

3. Click **Calibrate All**.

Using the Capture Tab

From the Operations window, click the Capture tab when you need to perform a scan.
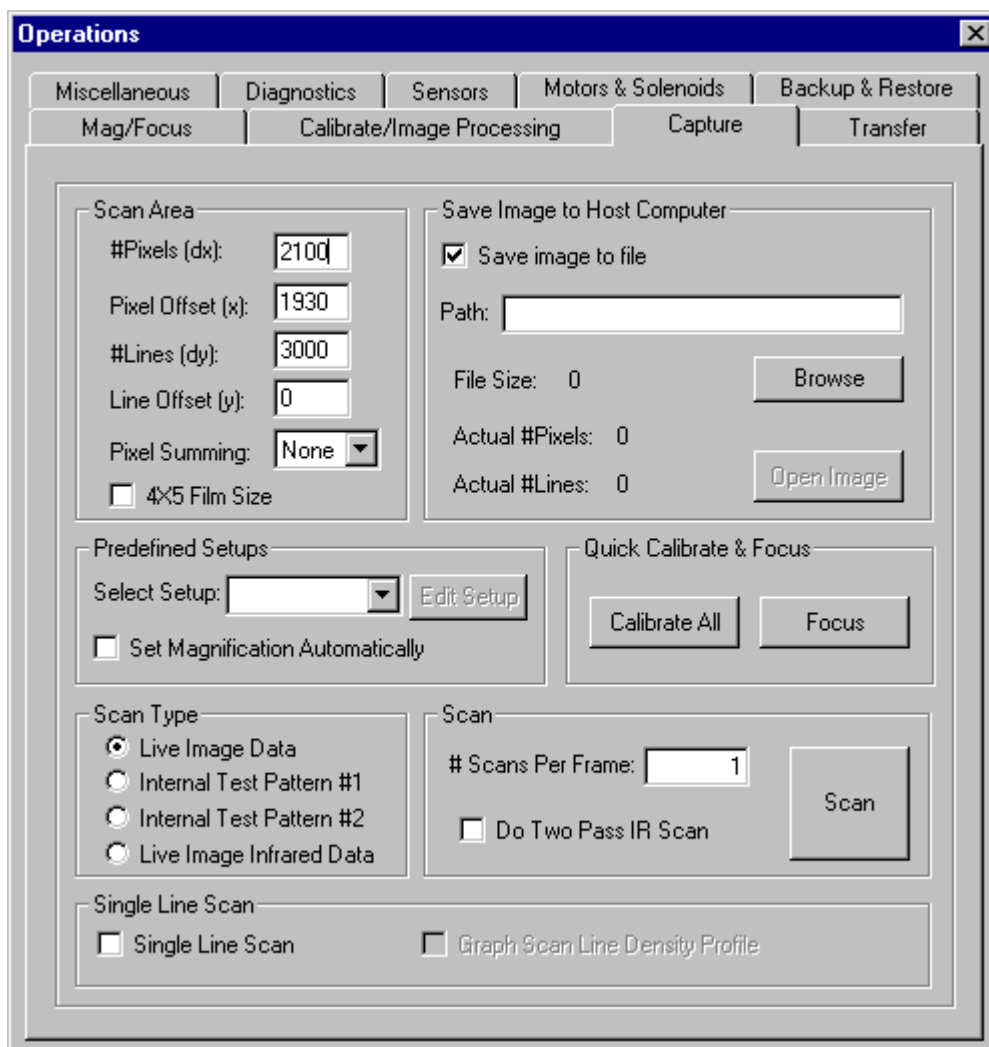
Setting the Scan Area

To set the Scan Area, enter values for:

- **# Pixels** (valid values range from 1 through 6002); for fastest scanning, enter a value of 1000
- **Pixel Offset** (valid values range from 0 through 6001)
- **# Lines** (valid values range from 1 through 7464)
- **Line Offset** (valid values range from 0 through 7463)
- **Pixel Summing** (valid values are None, 1:2, and 1:4)

  NOTE: If you select **Pixel Summing** of 1:2 or 1:4, use the **Actual #Pixels** and **Actual #Lines** for viewing the image in the *Adobe Photoshop* program.

Scanning the Image Data

1. If desired, save the scanned image as a file:

   a. Enter the Path information (file destination).

   b. Select **Save image to file**.

2. Click **Scan**.

Using the Miscellaneous Tab

Clicking the Miscellaneous tab on the Operations window lets you:

- turn the lamp on and off
- reset the lamp timer to zero
- reboot the scanner
- initialize the scanner
- set the scanner clock
- get scanner usage information
- get scanner attributes
- get version information

Click the appropriate button to perform the corresponding function.
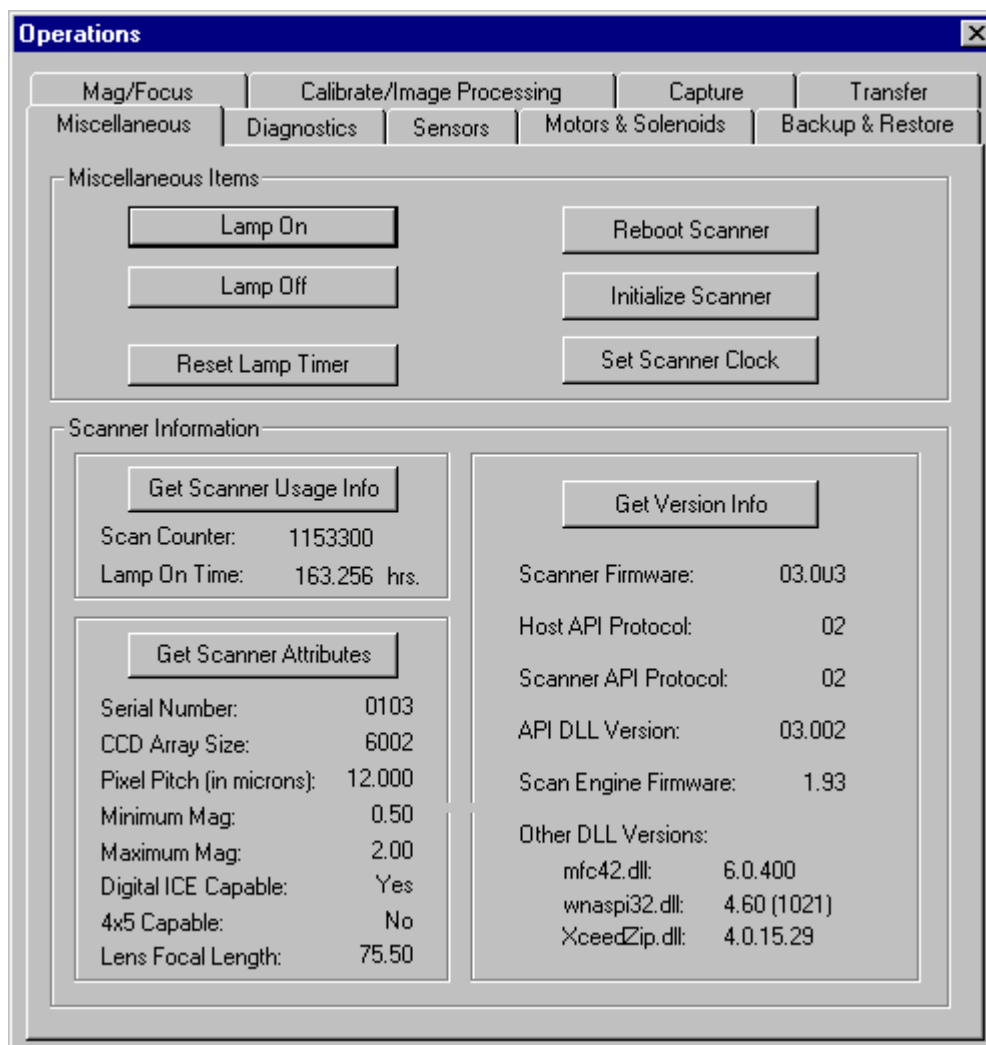
Backing Up and Restoring Files

From the Operations window, click the Backup & Restore tab when you need to perform either a backup or restore of the scanner files.

• Click **Backup** to back up scanner files.

>   **CAUTION: Use Restore only when recommended by a Kodak support person.**

• Click **Restore** to copy backed up files to the scanner.

Operations   ✕

| Mag/Focus | Calibrate/Image Processing | Capture | Transfer |
| Miscellaneous | Diagnostics | Sensors | Motors & Solenoids | Backup & Restore |

Pressing the Backup button will cause the creation of a backup subdirectory under "C:\HR500 SAM" that will contain two subdirectories, factory and current. Critical files from the scanner will be copied, one at a time, to these directories, overwriting any pre-existing files with the same names.

Restore will copy the same files back to the scanner. If the files don't exist in the subdirectories, the restore will fail. The error will be reported on a file by file basis.

[__Backup__]   [__Restore__]

Backup & Restore to/from Specified Location
Folder to Backup to or Restore from:

[   ] [Browse]

[Backup]   [Restore]

Appendix B: Ordering Accessories and Supplies

Accessories

Item Description	Order Number
Manual: *Kodak Professional* HR 500 Plus Film & HR Universal Film Scanners User's Guide	6B7198
Kodak Professional HR 500 Scanner Long Roll Accessory	158 5496
Kodak Professional HR 500 35mm Scanner Strip Gate Accessory	843 0316
Kodak Professional HR 500 Scanner 120 Strip Gate Accessory	844 0554
Kodak Professional HR 500/Universal Scanner 35 x 45.2 Film Gate	892 3880
Kodak Professional HR 500 Film Holders	890 7776

Kodak Professional HR 500 Carded Negative Film Gates
    A-Crop
    B-Crop
    C-Crop
    D-Crop
    E-Crop
    F-Crop
    G-Crop
    H-Crop
    A-Square
    B-Square
    C-Square
    D-Square
    E-Square
	141 1099

Available Accessories

Item Description	Order Number

Static Elimination Kit
    Available from:
    Holter Associates, Inc.
    1170 Pittsford-Victor Road, Pittsford, NY 14534
    Phone: (716) 381-7988; Fax: (716) 381-2351	

115 V Kit – Static Elimination Kit	2RSM80-115
230 V Kit – Static Elimination Kit	2RSM80-230

Super Film Cleaner or an equivalent cleaner with ionized air and particle transfer rollers (PTR)
    Super Film Cleaner is available from:
    Brooke International
    P.O. Box 300
    Hansville, WA 98340-0300
    Phone: (360) 638-2591; Fax: (360) 630-1658	

Polymag Film Strip Cleaner available from:
    www.polymagtek.com
    Phone: (800) 787-0830	

Supplies

Item Description	Order Number
GE ELC Lamp	106 3189
Microfiber Cleaning Cloths	980 4014

e-wipes
    Available from:
    Photographic Solutions, Inc.
    Phone: (800) 637-3212; Fax: (508) 759-9699	

Appendix C: Scanner Specifications

Site Specifications	
AC Power Requirements	1,750 watts peak
AC Frequency	50 or 60 Hz
AC Phase	Single
Operating Environment	Room temperature: 65 to 80° F (18 to 27° C) Relative humidity: 20 to 70% Ambient light: less than 1000 lux; no exposure to direct lighting Altitude: 7000 feet (2134 m) maximum

Scanner Specifications	
Dimensions and Weight	Height: 15 in. (38,1 cm) Width: 24 in. (61 cm) Depth: 30 in. (76,2 cm) Weight: 120 lbs (54,5 kg) Footprint: 5 square feet
Operating and Service Clearances	Rear: 1.5 feet (45,7 cm) for operation, 3 feet (91,4 cm) for service Sides: 2 feet (60 cm) for operation and service Front: 4 feet (122,9 cm) for operation and service
Scanner Location	The scanner location relative to the host workstation is limited by the SCSI interface cable length; if you are using a cable stocked by Kodak, this distance is 2 meters or less. Longer cables are not supported for use with the scanner. The scanner must be the only SCSI device attached to the host computer. The scanner should be located on a table that: • is stable • can support approximately 120 lbs (54,5 kg) • is at least 30 in. (76,2 cm) long x 30 in. (76,2 cm) wide
Power Consumption and Thermal Load	Power Consumption: 425 watts maximum; 400 watts typical Thermal Load: 1325 BTU operating; 1230 BTU standby
AC Voltage and Current Draw	100 V AC/50 Hz 4.2 amps operating; 3.9 amps standby 100 V AC/60 Hz 4.1 amps operating; 3.85 amps standby 120 V AC/50 Hz 3.5 amps operating; 3.2 amps standby 200 V AC/60 Hz 2.0 amps operating; 1.9 amps standby 200 V AC/50 Hz 2.0 amps operating; 1.85 amps standby 230 V AC/60 Hz 1.8 amps operating; 1.7 amps standby 250 V AC/50 Hz 1.75 amps operating; 1.65 amps standby

Appendix D: Using the Long Roll Accessory

The *Kodak Professional* HR 500 Film Scanner Long Roll Accessory lets you scan rolls of 35 mm-, 46 mm-, 70 mm-, and 120/220-size edited film.

IMPORTANT: *The Long Roll Accessory must not be installed when you scan a 4 x 5-in. image.*

Because of the variability of both film editors and scanners, you must:

- *set the punch reader height*
- *calibrate the sensor offsets if you are using SAM to operate your scanner*
- *use aperture plates dedicated to your scanner*

For the highest quality scans:

- before scanning, to reduce the chance of artifacts, clean the film with Super Film Cleaner (see *Appendix B: Ordering Accessories and Supplies*) or an equivalent cleaner that has ionized air and particle transfer rollers (PTR)
- install and use the appropriate static elimination kit (see *Appendix B: Ordering Accessories and Supplies*)
- follow daily maintenance procedures to clean the rollers and the punch readers on the Long Roll Accessory
- calibrate the scanner for each new roll of film

CAUTION: Kodak recommends that you use one-inch film cores with the Long Roll Accessory. However, your lab may require that you use 3/4-inch film cores. It is critical that the fast forward and rewind speeds are correct for the size core you use. The fast forward and rewind speeds should never be greater than 10 inches per second.

If you use	*One-inch film cores*	*3/4-inch film cores*
	Maximum speed is 10 inches per second.	Maximum speed is 8 inches per second.
DP2 software	Consult your DP2 (*Kodak Professional* Digital Print Production Software) documentation.	
SAM software	See the instructions on page D-29.	

IMPORTANT: *Before beginning the following installation procedure, check that the shipping box contains all items on the packing list. If it does not, contact your Kodak representative.*

Installing the Software for the Long Roll Accessory

1. With the PC powered off, power on the scanner.

2. Wait for the series of 3 beeps to sound at the scanner (or for the lamp to illuminate).

You must have version 3.0 or higher of SAM (Service and Assembly Module) diagnostic software installed on the host computer and version 3.0 or higher of firmware on your scanner.

Downloading the Software and Firmware from KODAK.COM

1. Go to:

   http://www.kodak.com/global/en/service/software/hr500/navigation.shtml

2. If the version numbers for either the SAM diagnostic software or firmware are higher than what is now installed on your scanner, follow the instructions on the Web site to download the newer versions of SAM and the HR 500 firmware.

3. Follow the installation instructions on the Web site.

Upgrading the Scanner's Firmware

Check the Web site (see page D-2) for the most up-to-date instructions.

1. Open SAM and click the Transfer tab on the Operations window.
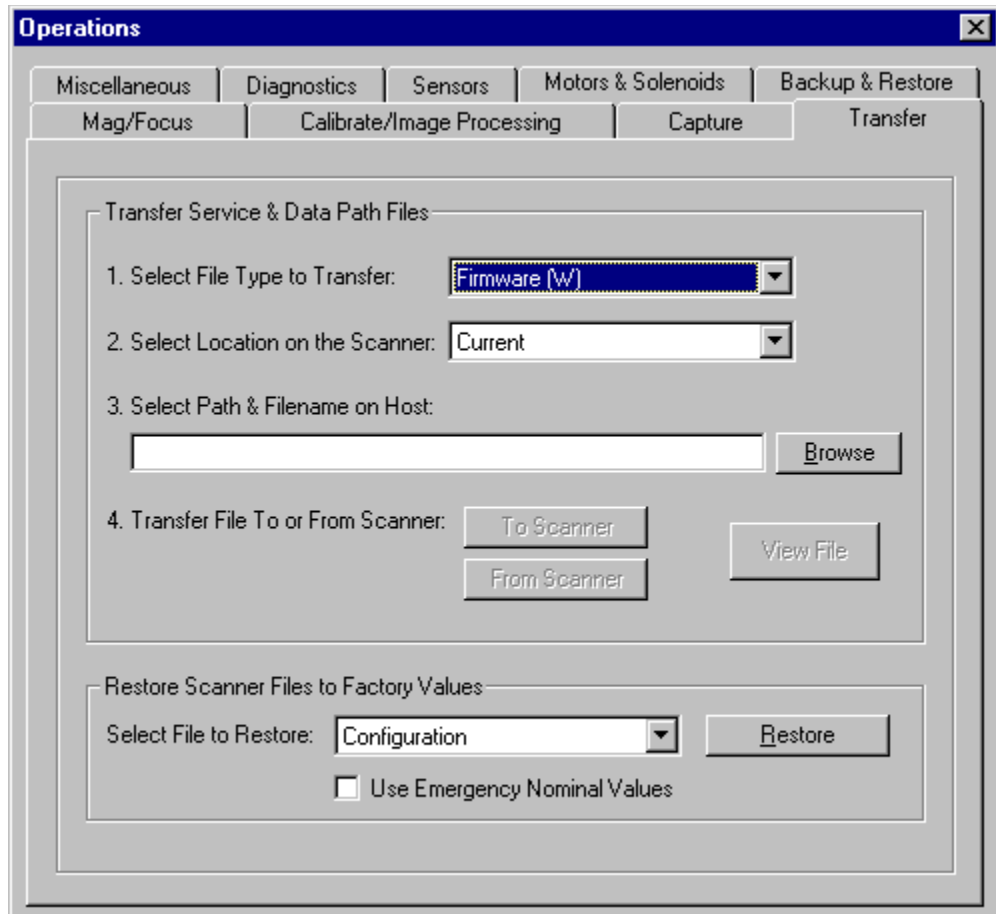
2. Make sure the **File Type** is Firmware (W).

3. Click **Browse** and find the .zip file that you downloaded from KODAK.COM (example: HR500\Px03_000.zip).

4. Click **Open**.

5. Make sure the Location on the Scanner is **Current**.

6. Click **To Scanner** to start the transfer.

   The transfer takes approximately one minute.

7. When the transfer is complete, select the Backup & Restore tab and click **Backup**.
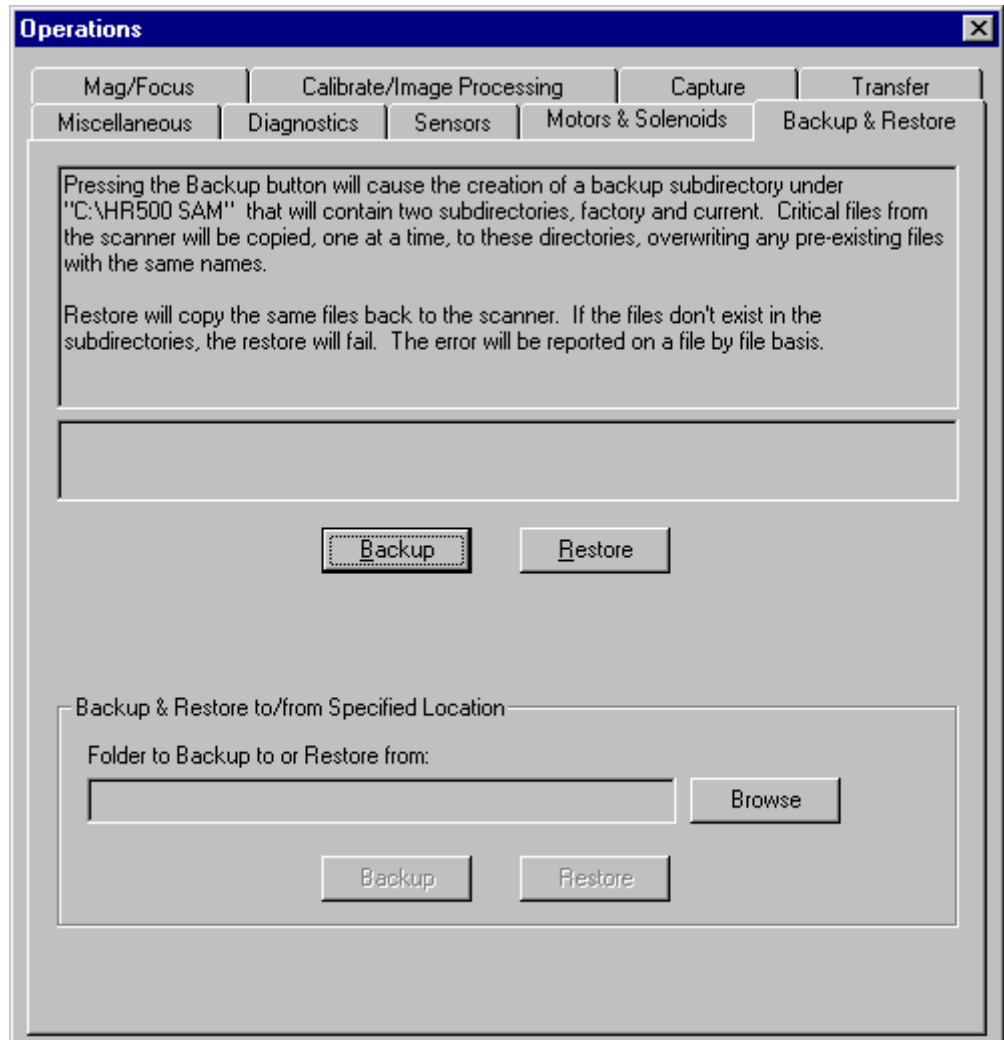
8. When the backup is complete, exit SAM.

Installing or Removing the Long Roll Accessory

IMPORTANT: Because of manufacturing tolerances, aperture plates and Long Roll Accessories cannot be interchanged.

If your lab has more than one Long Roll Accessory, you may want to use labels with the same colors or numbers to identify aperture plates with the associated Long Roll Accessory.

Overview of Parts

The parts shown below are shipped with the Long Roll Accessory. Although not shown, 5 aperture plates are also shipped with each Long Roll Accessory.
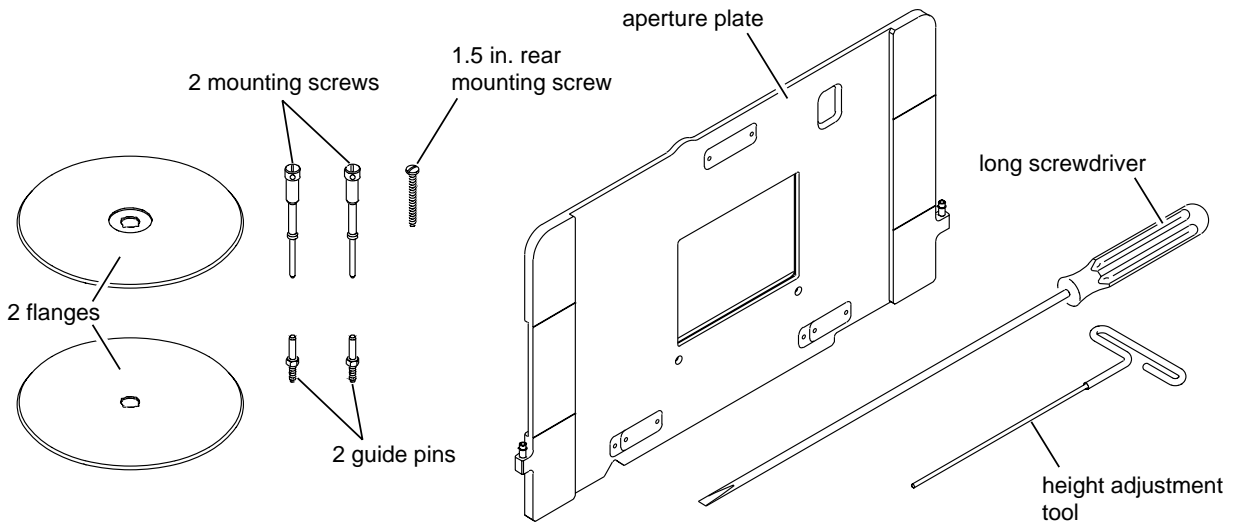
Preparing the Scanner for the Long Roll Accessory

You must remove the film holder guide from the scanner before you install the Long Roll Accessory.
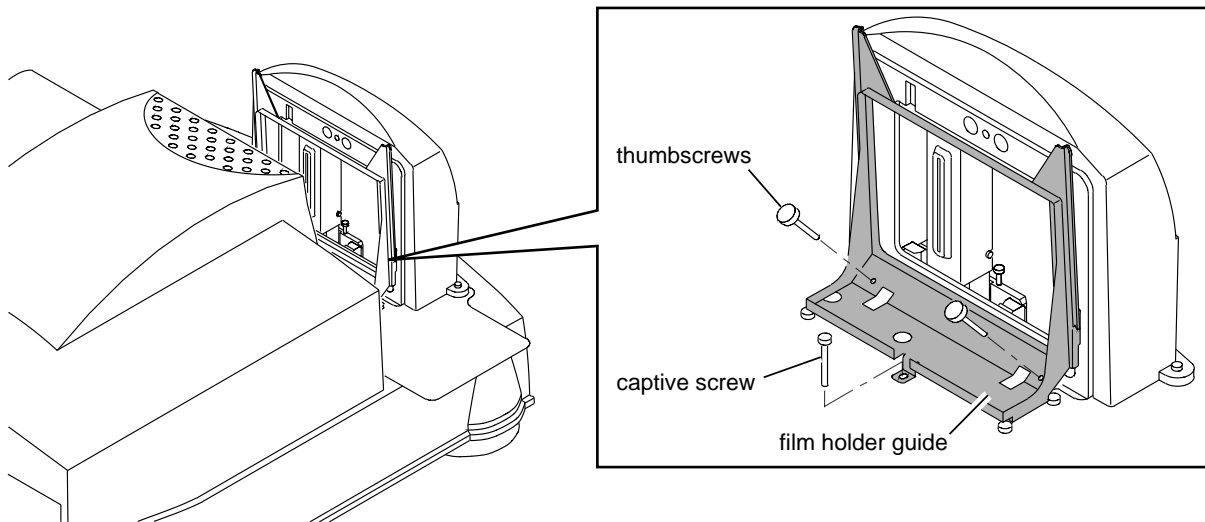
CAUTION: **As indicated in Step 1 below, make sure the scanner is powered OFF.**

1. Power off the scanner.

2. Remove the two thumbscrews and loosen the captive screw.

3. Lift the film holder guide up and off the scanner.

CAUTION: Use canned or pressurized air to remove any dust or debris from the connector.
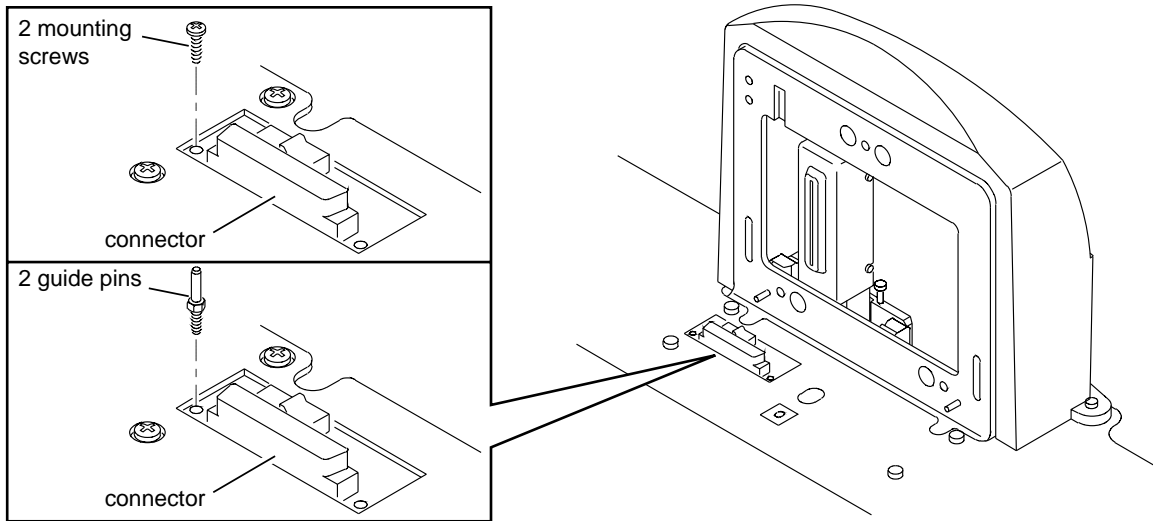
4. Inspect and remove any dust and debris from the connector.

5. Remove the two mounting screws on each side of the connector.

6. Insert the two guide pins in the holes from which you removed the mounting screws.

7. Tighten the guide pins with a 1/4-in. open-end wrench.

Attaching the Long Roll Accessory to the Scanner

CAUTION: Make sure the scanner is powered OFF.

1. Grasp the large rectangular opening to lift and remove the Long Roll Accessory from the shipping box.

tension arm toward
rear of scanner

pressure roller
housing toward you

rectangular
opening

pressure roller housing
toward you

tension arm toward
rear of scanner
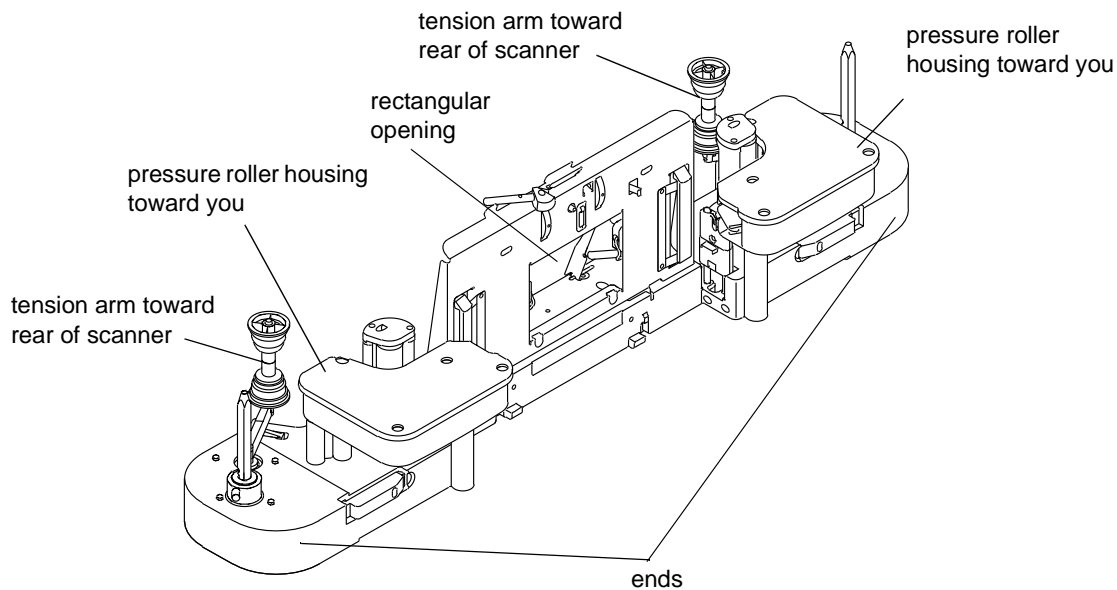
ends

2. Hold the Long Roll Accessory at the ends and carry it to the scanner.

3. Position the Long Roll Accessory so the two pressure roller housings are toward you and the two tension arms are toward the rear of the scanner.

CAUTION: Avoid hitting the light bar and the safety switch on the scanner.

4. Center the alignment blocks on the Long Roll Accessory between the two dowel pins on the scanner.

alignment block

dowel pin

Long Roll Accessory
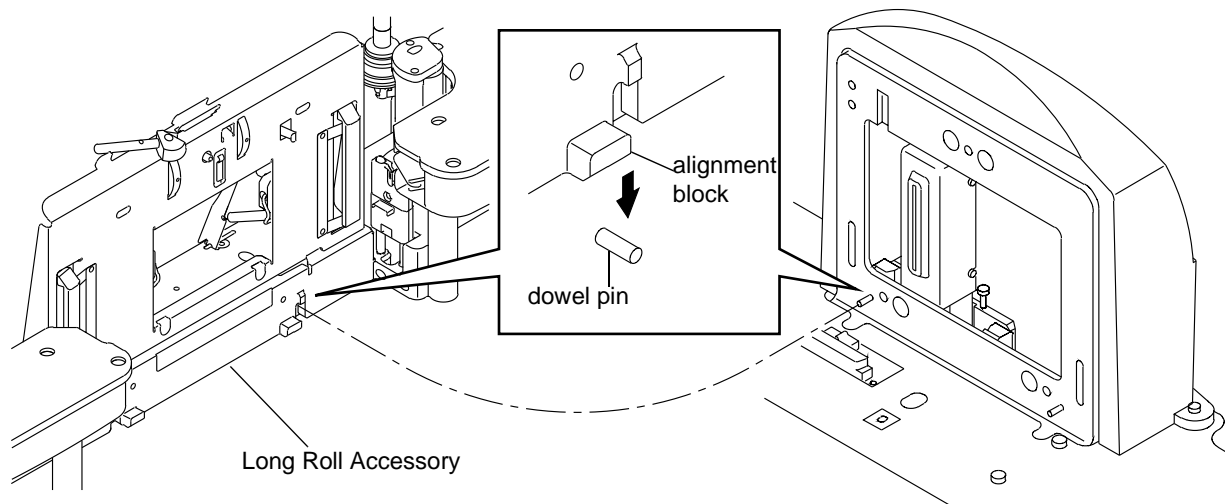
5. Gradually lower the Long Roll Accessory to rest in place on the scanner.

CAUTION: When installing the mounting screws in the next step, use care to avoid

- **dropping the screws inside the scanner**
- **cross threading the screws**

mounting screws

rear mounting screw
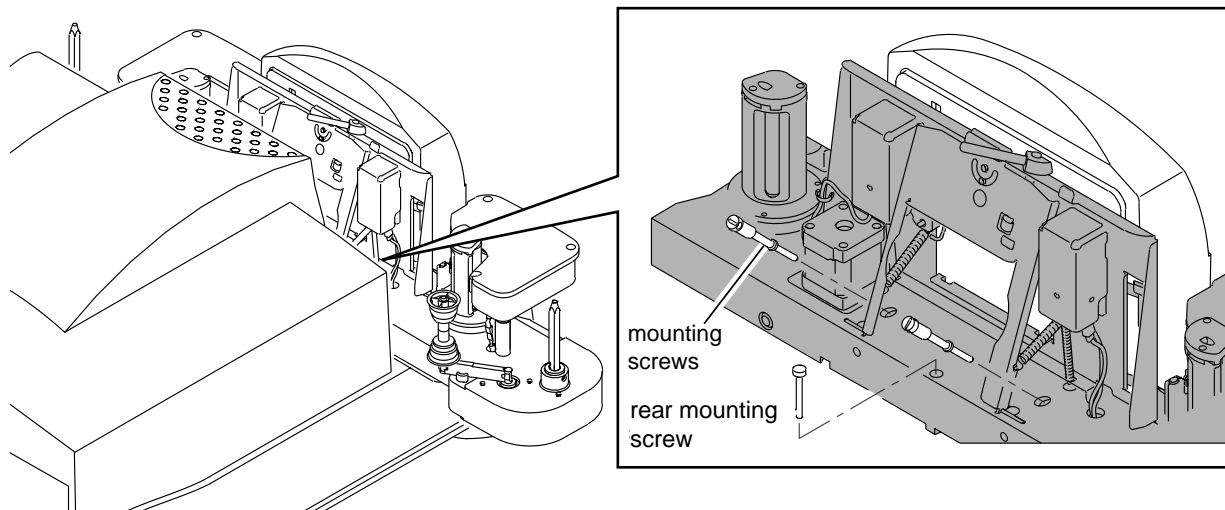
6. Install, but do not fully tighten, the rear mounting screw.

7. Hold each of the two mounting screws at the angle of the holes (approximately 45 degrees) and install, but do not tighten, the screws.

   CAUTION: In the next step, do not overtighten the mounting screws.

8. Using the long screwdriver provided, tighten the 3 mounting screws until you feel resistance.

Latching and Unlatching the Gate Actuator

Be sure you know how to latch and unlatch the gate actuator before installing the aperture plate. The gate actuator must be in the unlatched position for film loading and in the latched position for scanning.

Latching the Gate Actuator

CAUTION: Be sure the gate actuator is latched before you move the locking arm to the locked position.

 1. Pull the gate actuator toward you until the gate "latches" in place.

 2. To lock the gate actuator, move the locking arm to the left (locked) position.

Unlatching the Gate Actuator

CAUTION: Always move the locking arm to the unlocked position before unlatching the gate.

To unlatch the gate actuator, manually squeeze the two tabs together and release.
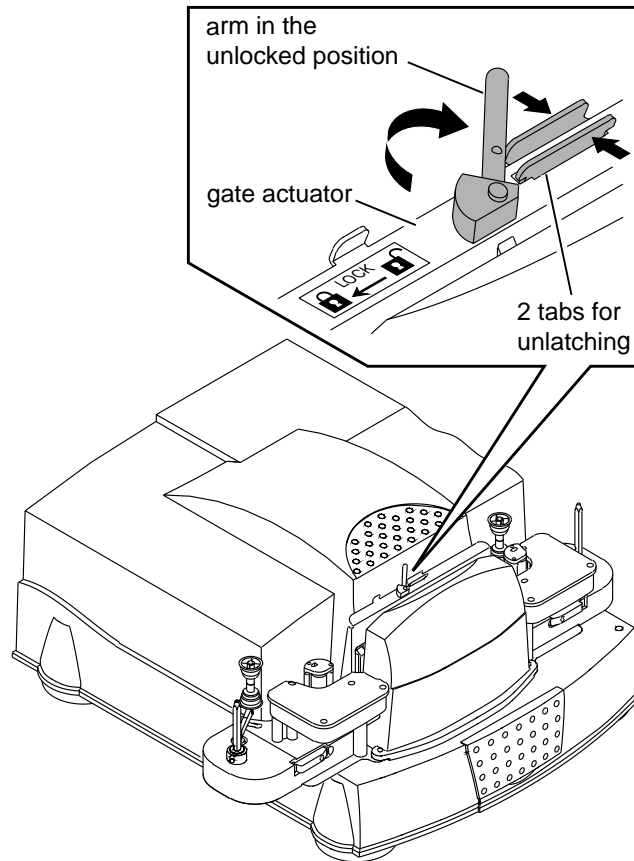
Installing the Aperture Plate

IMPORTANT: To power on the scanner without error, an aperture plate must be installed, latched, and locked.

1. Choose the aperture plate corresponding to the film format you will be scanning.

lettering on left side
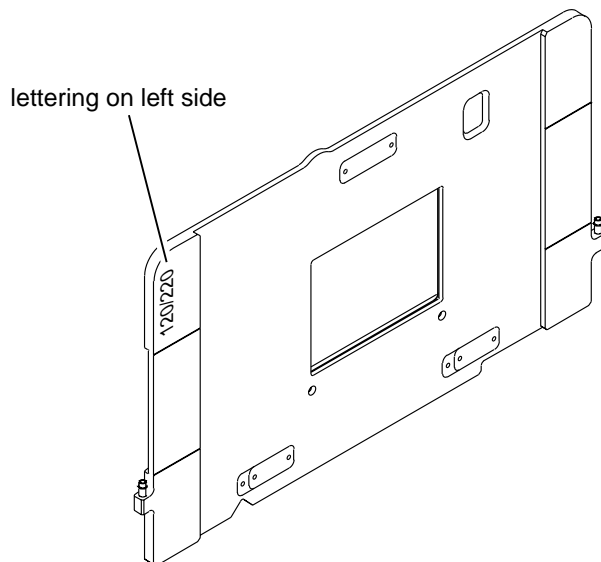
2. Position the aperture plate with the lettering (example: 120/220) visible on the left side.

   CAUTION: Installing an aperture plate backwards may result in a damaged light bar.

3. Make sure the gate actuator is unlatched for film loading.

4. Center the aperture plate on the lamphouse cover.
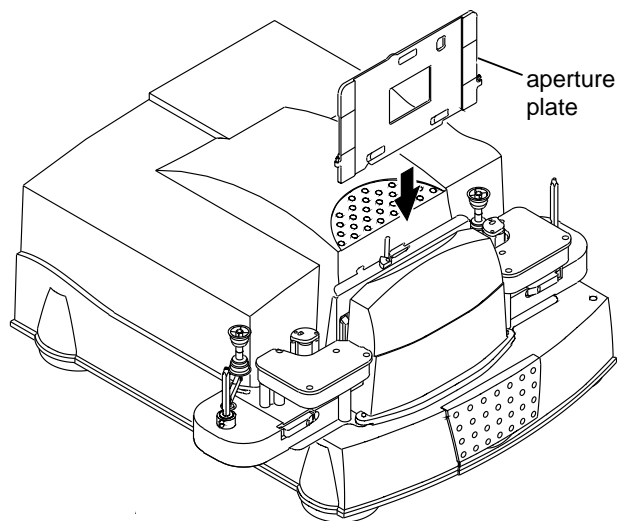
aperture plate

5. Gently lower the aperture plate and, when you feel resistance, push until it is secured.

Removing the Long Roll Accessory from the Scanner

It may be necessary to remove the Long Roll Accessory from the scanner.

CAUTION: Make sure the scanner is powered OFF.

To remove the Long Roll Accessory, reverse the installation procedure (see pages D-8 through D-12 for more details):

1. Remove the aperture plate from the Long Roll Accessory. See *Latching and Unlatching the Gate Actuator* on page D-11.

2. Power off the scanner.

   CAUTION: When removing the mounting screws in the next step, use care to avoid dropping the screws inside the scanner.

3. Loosen and remove the 3 mounting screws.

   CAUTION: Avoid hitting the light bar and the safety switch.

4. Remove and lift the Long Roll Accessory from the scanner.

5. Place the Long Roll Accessory on a flat surface.

Punch Sensors

The punch (data hole) sensors are set up at the factory for negative-type film and require no adjustment during the installation procedure. If you will be scanning film that has a significantly higher or lower D-min from negative film, such as black-and-white film or color positive film, see *Determining and Setting the Trigger Points* on page D-31.

Setting the Punch Reader Height for the Current Film Size

Because of differences in film editors, there is no standard punch reader height. You must set the height of the left and right punch readers, one at a time, to accommodate your editor.

For each film size that you use:

*   Install the appropriate aperture plate.
*   Adjust the core locator height on the spindle.
*   Thread the film.
*   Set the punch reader height (this is a one-time adjustment that can be done during installation or when the aperture plate is used for the first time).

The aperture plate should already be installed. If not, install it (see *Installing the Aperture Plate* on page D-12).

Adjusting the Core Locator Height on the Spindle

The spindles on the Long Roll Accessory have core locators to accommodate different film sizes.

detent for
35 mm

detent for
46 mm

detent for
120/220

detent for
70 mm

core locator
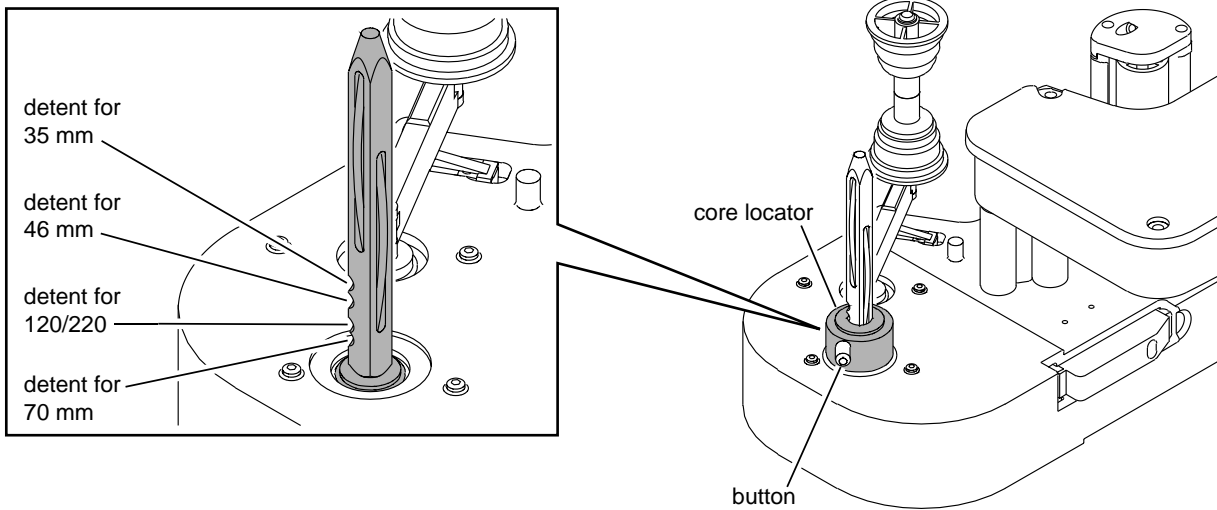
button

Push and hold the button to release and position the core locator at the correct detent. Release the button at the detent you want. The detent positions are:

• 35 mm (top)
• 46 mm
• 120/220 (62 mm)
• 70 mm (bottom; closest to Long Roll Accessory)

Loading and Threading Film

IMPORTANT: *Careful handling of film is extremely important. Before loading film, clean the film with Super Film Cleaner or an equivalent cleaner that has ionized air and particle transfer rollers (PTR).*

Use canned air to clean the punch readers before threading film.

Before loading film, make sure you have at least 2 feet (.6 meters) of leader at each end of the roll.

CAUTION: **In the steps below, be sure you determine and use the correct orientation of the flange. Incorrect setup will result in film tracking problems and loose takeups.**

1. Determine the orientation of the flange for the reel or core you selected for loading:

   • A flange in the upright position is for thin reels
   • A flipped flange is for film on cores
   • No flanges are needed for thick reels
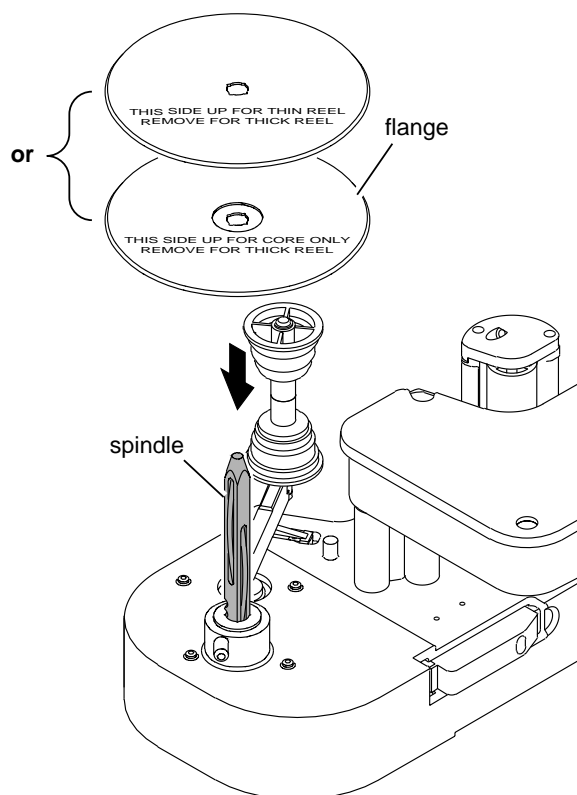
2. If you are using either thin reels or core only, install the flanges on the spindles with the appropriate side up.

Threading the Film

1. Position the film with the data holes down and the emulsion toward the imager.

emulsion side

data holes
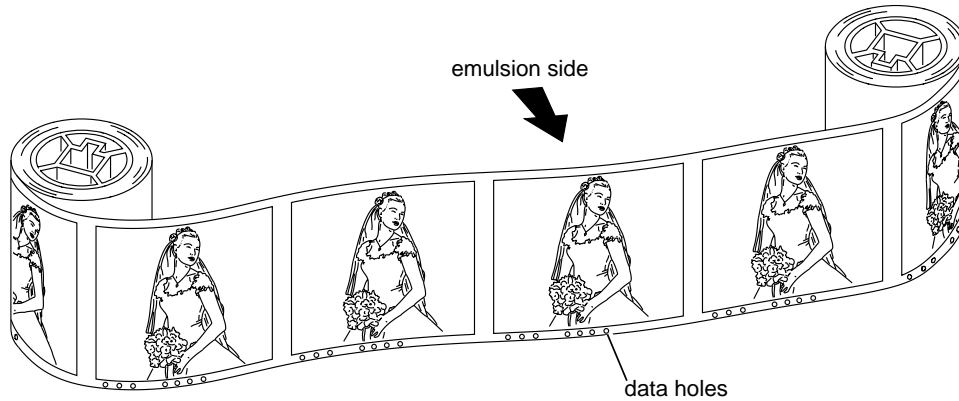
You can thread the film from either side of the Long Roll Accessory.

2. Install the film on the spindle.

idler arm

spindle

drive roller
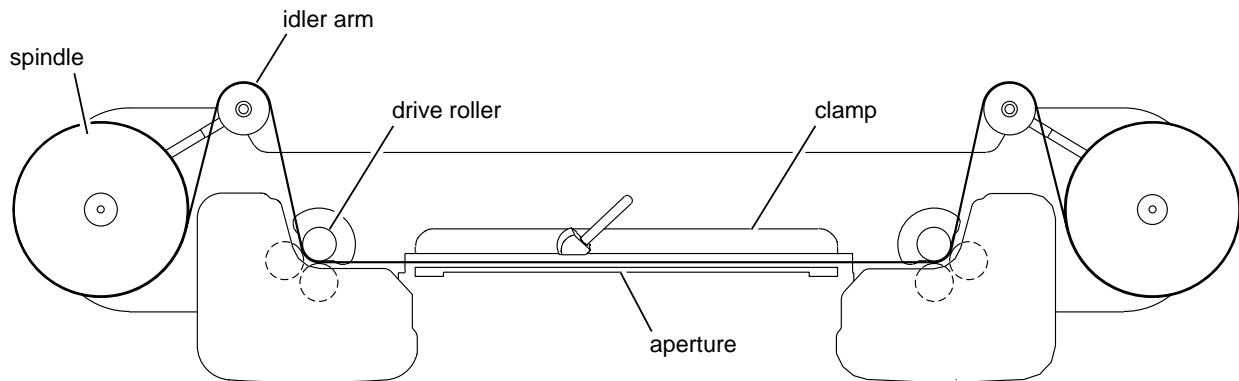
clamp

aperture

3. Thread the film:

   a. around the idler arm

   b. around the drive roller

   c. between the aperture and the clamp, keeping the film in the track (grasp the film on either side to locate the film in the track)

   d. around the drive roller and idler arm

4. After the film is threaded, pull the gate actuator forward to latch it against the aperture plate. Move the locking arm to the left (locked position).
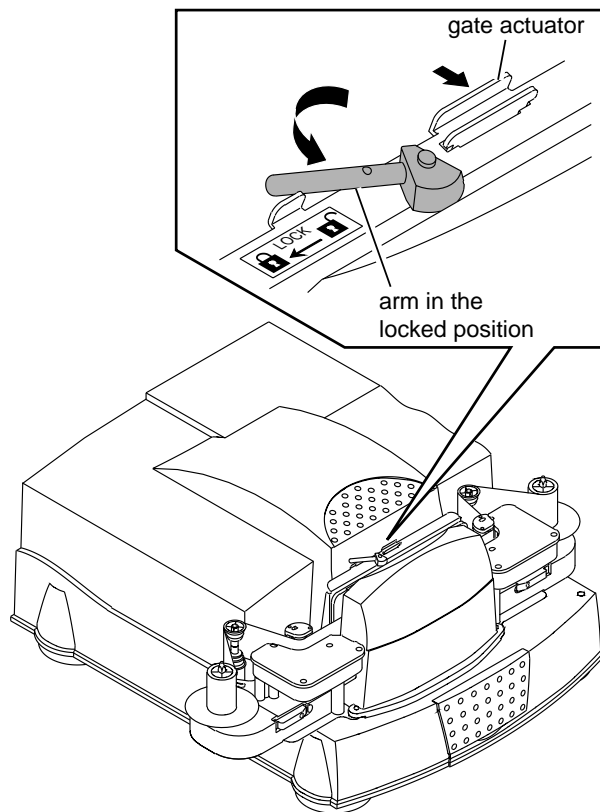
Setting the Punch Reader Height

1. Open SAM.

2. Click the LAMP button to turn the lamp off. When the lamp is off, it is easier to work in the area of the punch reader.

toggles to turn the lamp off and on

3. Select *View>Film Controls.*

Film Cont... ⊠
Load Film
Tension Off
Load First Frm
Next Frame
Prev. Frame
Seek Frame
Read Next
Read Prev.
< Position
Position >
<< Rewind
Fast Fwrd >>
Clean Rollers
Stop

4. Click **Load Film**.

   A dialog box appears.

5. Click **OK**.

6. In preparation for the reader height adjustment, click **Fast Fwrd>>** to advance the film approximately 10 feet, then click **<<Rewind** to reverse the film the same distance.

   NOTE: Advancing and rewinding the film ensures that the film is correctly positioned in the film track relative to the readers.

Installing the Adjustment Tool

1. Locate the left and right adjusting screws on either side of the aperture plate.

2. Install the height adjustment tool in the right or left adjusting screw.

   NOTE: You will install the adjusting tool in each adjusting screw; whether it is the left or right screw is determined by which punch reader you adjust first.

height adjustment tool

punch reader

adjusting screw

adjusting screw

adjusting screw
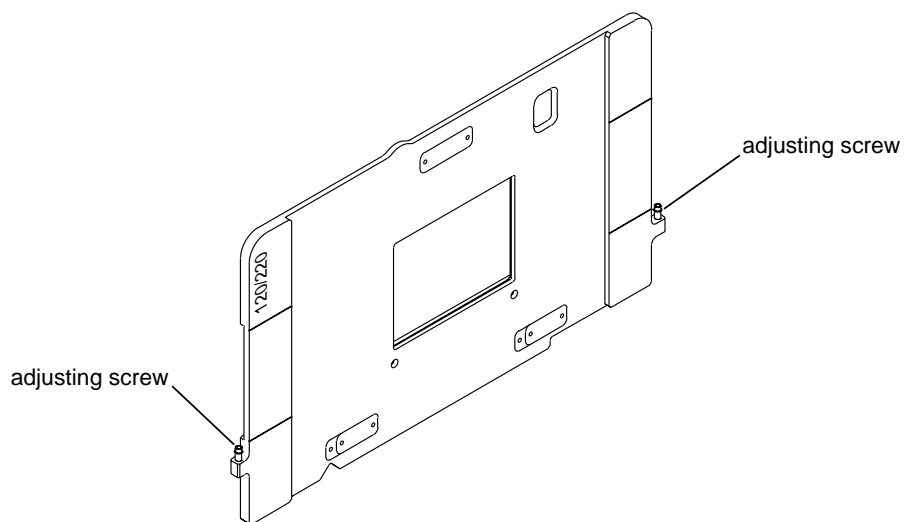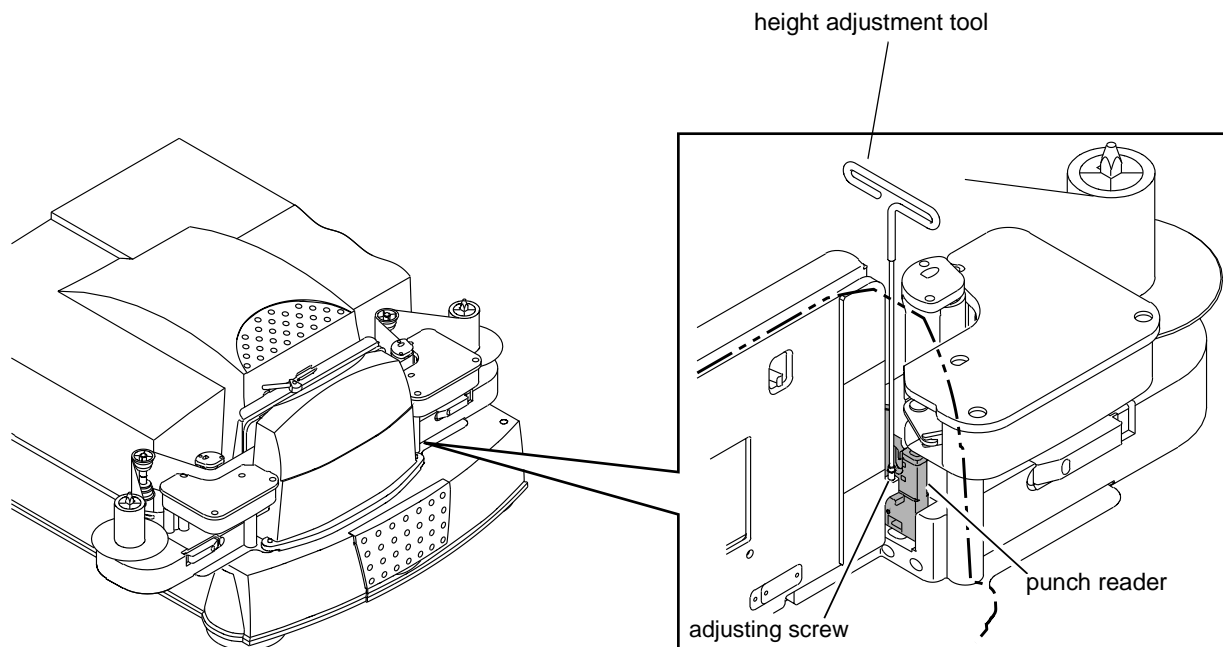
Visually Checking the Punch Reader Height

1. Look at the small blue light located in the notch at the top of the punch reader, which is below the pressure rollers and adjacent to the edge of the aperture. The blue light should be in line with the punches in the film.

2. Align the light to the data holes by turning the adjusting screw clockwise to lower the light or counterclockwise to raise the light.
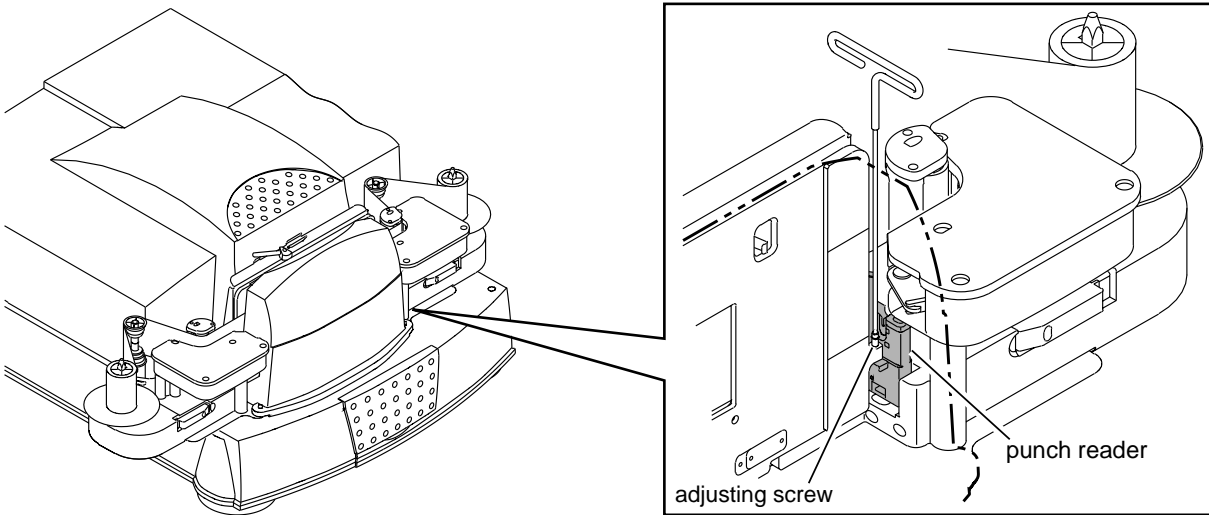
Adjusting the Punch Reader Height

Adjust both the left and right reader heights such that the punch reader fully distinguishes between a data hole and film.

No specific numbers represent data holes or film, but lower numbers indicate the presence of film and higher numbers indicate the presence of data holes. (See *Recording the Highest Numbers on the LEDs* on page D-31 for the location of the LED numbers.)

For both the left and right readers:

1. On the Film Controls window, click **Position >** several times to advance the film. As you advance the film, the reader should sense both holes and film.

   If you do not see a significantly higher number after you see data holes, repeat *Visually Checking the Punch Reader Height* on page D-21

2. When you see a significantly higher number, stop advancing the film. Turn the adjusting screw until the number is maximized.

   For example, as you click **Position >**, you may see a value of 580, but when you stop advancing the film and turn the adjusting screw, you may see a value of 620. This indicates a more effective reader height.

3. Repeat steps 1 and 2 to advance the film to another position and confirm your adjustment.

4. From SAM, turn the lamp on.

When the above procedures have been completed, you can begin scanning. Use your *Kodak Professional* Digital Print Production Software (DP2) (help is included) to produce quality scans.

IMPORTANT: *Remember to recalibrate the scanner for each roll of film. Use a camel's hair brush and canned air to remove dirt or dust from the light bar.*

Appendix D-1: Calibrating the Sensor Offsets

IMPORTANT: Do this procedure only if you will be using SAM to operate the scanner.

Do this procedure twice, once for the left sensor and once for the right sensor. For best visibility, use the largest film format you have.

It is not necessary to prepare and load the film twice.

Preparing and Loading the Film

1. Create a roll of film with the center of several frames clearly marked.
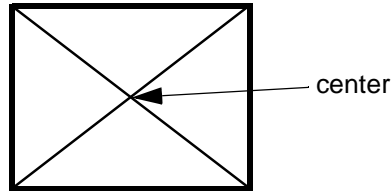
center

2. Edit the roll of film, making sure to center the mark in the crop box on the editor.

3. Load the edited film, beginning at the *left* side of the scanner (see *Loading and Threading Film* on page D-16).

4. In SAM, select *View>Film Controls.*

5. Click **Load Film**.

6. When the dialog box appears, click **OK**.

Setting the Lens Magnification

1. If the Operations window is not visible in SAM, select
   View>Operations Controls.
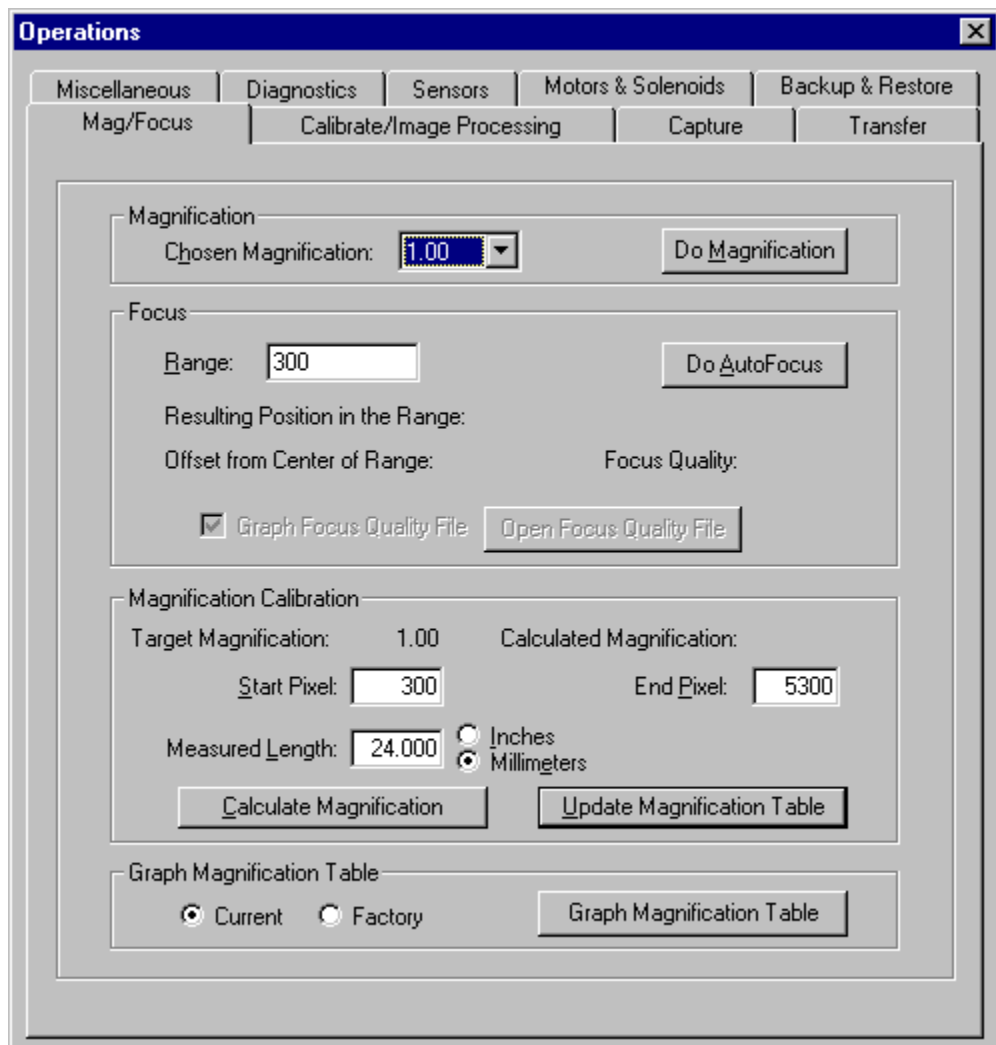
2. Select **1.00** as the **Chosen Magnification**.

3. Click **Do Magnification**.

4. Close the Operations window.

Setting the Scan Parameters

1. Select *Test>Long Roll Capture* from the SAM menu.

Long Roll Capture Test

Test Cycle Setup

Base Directory:

Browse

◉ Don't Write the Image to a File
○ Always Write to Test File (TestScan.raw)
○ Generate File Names from Punch Number
☐ Don't Stop Test On Errors
☐ Delay 10 min after 2000 scans

Number Of Cycles To Run: 1

Number of Frames/Cycle To Scan: 50

Number Of Frames Between Scans: 0

Scan And Positioning Info.

#Pixels (dx): 2600
Pixel Offset (x): 1500
#Lines (dy) 3600
Line Offset (y): 0

Pixel Summing: None

X Offset (.001"): 0

Controls

Start Scanning

Pause

Continue

Stop

Input Output Status

Scanning:

Writing To Disk:

File Size: 0

Statistics

Last Frame's Rate: 0
Avg. sec./ frm: 0
Avg. frms / hr: 0
Total Frames: 0
Total Cycles: 0

Found in 1 Retry: 0
Found in 2 Retries: 0
Found in 3 Retries: 0
Found in 4 Retries: 0
Not Found: 0

Reset Statistics

2. Set the Scan and Positioning Info.

    a. Set the **#Lines (dy)** to 1.

    b. Set the **Line Offset (y)** to 0.

    c. Set **Pixel Summing** to None.

    d. Keep the default values for #Pixels (dx), Pixel Offset (x) and X Offset.

    IMPORTANT: Make sure you close the Test Long Roll Capture window in the next step.

3. Close the Test Long Roll Capture window.

Locating the First Punched Frame

1. On the Film Controls dialog box, click **Load First Frm**. A dialog box appears.

```
┌─────────────────────────────────────────────────────┐
│ Film Loading                                    [X] │
├─────────────────────────────────────────────────────┤
│         TO START A ROLL, YOU MUST SET THE FIRST     │
│        PUNCH NUMBER AND THE DIRECTION THAT THE      │
│              FILM WILL BE PROCESSING.               │
│                                                     │
│   First Punch Number:       [-1              ]      │
│   ┌─ Film Processing Direction ──────────────────┐  │
│   │                                              │  │
│   │    ⦿ Forward  (Left To Right)                │  │
│   │                                              │  │
│   │    ○ Reverse  (Right To Left)                │  │
│   │                                              │  │
│   └──────────────────────────────────────────────┘  │
│                       [  Cancel  ]    [    Go    ]  │
└─────────────────────────────────────────────────────┘
```
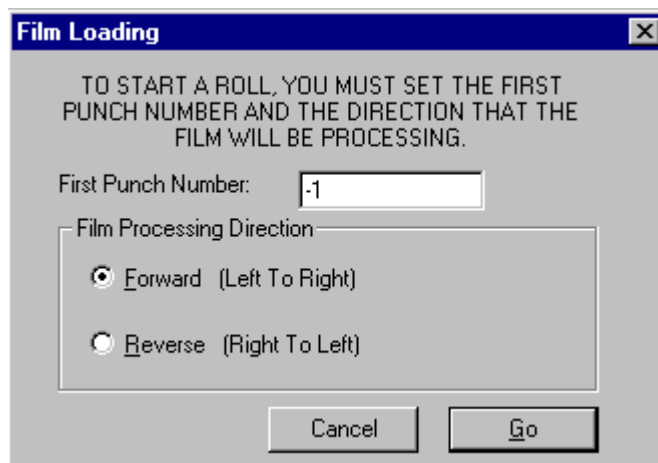
2. Select the Film Processing Direction:

   - If you are calibrating the left sensor offset, select **Forward (Left to Right)**.
   - If you are calibrating the right sensor offset, select **Reverse (Right to Left)**.

3. Type **-1** in the **First Punch Number** field.

   -1 tells the scanner software to find the first punch (in the specified direction).

4. Click **Go**.

Disk Logging Active	Current Punch = 100	Target Punch = 000			
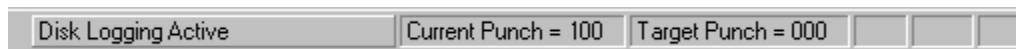
The status bar shows the Current Punch (the first punch found). The example shows that the first punch found is 100.

5. On the Film Controls dialog box, click **Seek Frame**.

A dialog box appears.
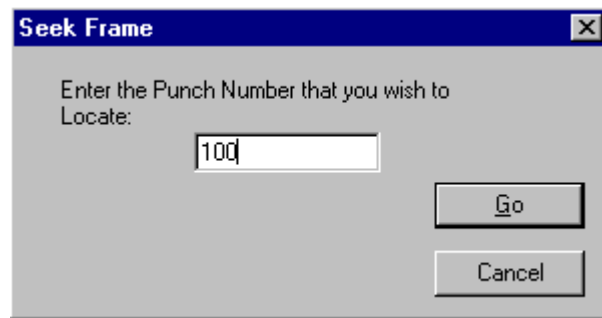
6. Type the **Punch Number** from the Current Punch on the status bar.

7. Click **Go**.

| Disk Logging Active | Current Punch = 100 | Target Punch = 100 | | | |
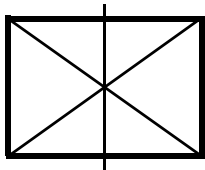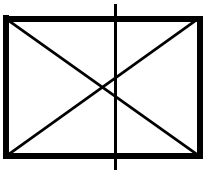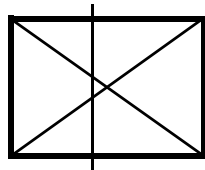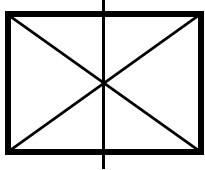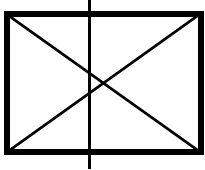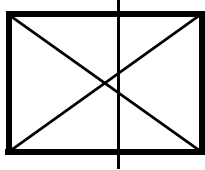
The Target Punch should equal the Current Punch.

Checking the Alignment and Adjusting the Sensor Offsets

1. Using a flashlight, look from the rear of the aperture to check the alignment of the marked frame with the aperture plate.

    The center of the frame should line up exactly with the right edge (from the front of the scanner) of the aperture plate.

    NOTE: The area beyond the aperture plate is not visible when you are checking the alignment.

	Center of the frame lines up exactly with the right edge of the aperture plate	**Center of the frame is beyond the edge of the aperture plate**	**Center of the frame has not reached the edge of the aperture plate**
Film is moving left to right			
Film is moving right to left			

2. In SAM, select *View>Configurations.*
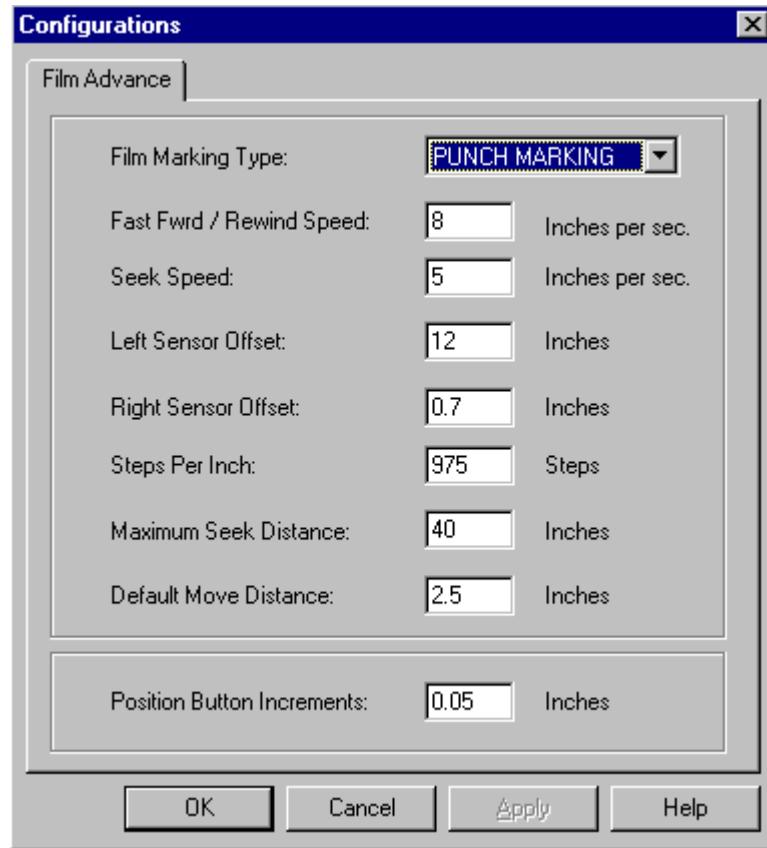
CAUTION: Fast Fwrd / Rewind Speed should never be greater than 10. If needed, change the speed to be 10 Inches per sec. or less.

As a guideline, the speed should be 10 inches per second if you use 1-inch film cores (the recommended size). The speed should be 8 inches per second if you must use 3/4-inch cores.

3. Make sure the correct **Film Marking Type** is selected and that the **Left** and **Right Sensor Offsets** are correct for the film and the editor you are using.

   a. For Offset Punch Editors, set the **Left Sensor Offset** to 12 and the **Right Sensor Offset** to 0.7.

   b. For Center Punch Editors, set the **Left Sensor Offset** to 7.75 and the **Right Sensor Offset** to 4.95.

4. Set **Position Button Increments** to 0.05 inches.

   This number determines the distance film is moved when you click the **Position>** button on the Film Controls window when setting the reader height.

5. Click **OK**.

6. If the marked frame is not aligned with the right edge of the aperture plate, select *View>Configurations*.
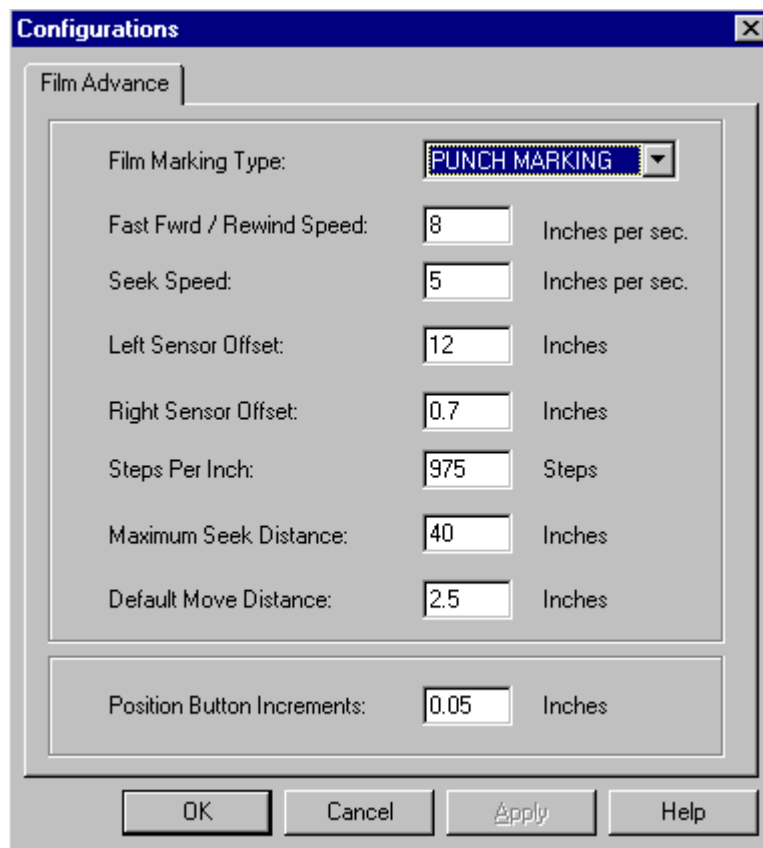
a. If the film is moving from left to right, change the **Left Sensor Offset**:

   If the center of the frame is beyond the right edge of the aperture plate, decrease the **Left Sensor Offset**.

   If the center of the frame has not reached the right edge of the aperture plate, increase the **Left Sensor Offset**.

b. If the film is moving from right to left, change the **Right Sensor Offset**:

   If the center of the frame is beyond the left edge of the aperture plate, decrease the **Right Sensor Offset**.

   If the center of the frame has not reached the left edge of the aperture plate, increase the **Right Sensor Offset**.

7. On the View Controls window, click **Next Frame**.

8. Repeat steps 1 through 7 until the center of the frame lines up exactly with the right edge of the aperture plate.

9. On the View Controls window, click **Fast Fwrd>>** to advance the roll of film to the right side.

10. Repeat *Locating the First Punched Frame* (see page D-26) and *Checking the Alignment and Adjusting the Sensor Offsets* (see page D-28) for the right sensor.

Appendix D-2: Determining and Setting the Trigger Points

IMPORTANT: *Do this procedure only if you will be scanning film that has a significantly higher or lower D-min from negative film, such as black-and-white film or color positive film.*

1. With the PC powered off, power on the scanner.

2. Wait for the series of 3 beeps to sound at the scanner (or for the lamp to illuminate).

3. Power on the PC.

Recording the Highest Numbers on the LEDs

IMPORTANT: *There must not be film in the scanner.*

1. Open the plastic cover.

2. Look at the red LED number on the right side of the Long Roll Accessory. Note this number as being the "highest" number on the right side.

plastic cover
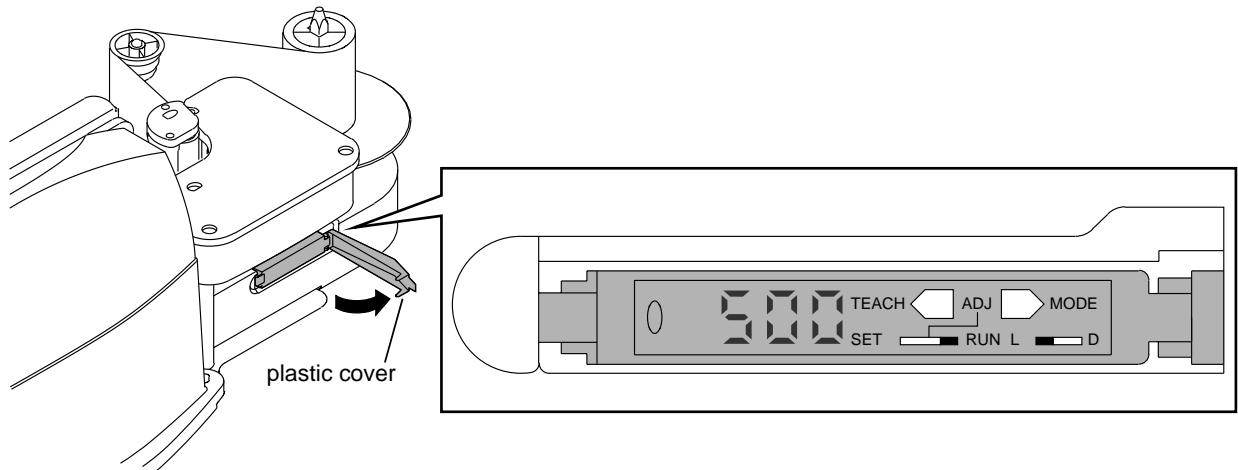
3. Look at the red LED number on the left side. Note this number as being the "highest" number on the left side.

4. Record the left and right highest numbers for later calculating the trigger numbers.

   Because the readers are separate, the left and right numbers will not be the same.

The trigger number tells the scanner when it senses a change in light level. You need to set the trigger number only once unless you will be using the scanner for multiple types of film, such as for both negative and positive.

Determining the Left Trigger Point

1. On the Film Controls window of SAM, click **Position >** to advance the film and determine the "average" low number (indicating the presence of film) on the left LED.

   An example is **120**.

2. Subtract the average low number from the highest number you recorded in step 3 under *Recording the Highest Numbers on the LEDs.*

   An example of the highest number is **800**. Subtracting 120 from 800 results in **680**.

3. Divide the result of step 2 by 4.

   Continuing the example, **680** divided by **4** equals **170**.

4. Add the result of step 3 to the average low number determined in step 1.

   The result is the left trigger point. Record this number.

   Continuing the example, **170** added to **120** equals **290**; 290 would be the left trigger point.

Determining the Right Trigger Point

1. On the Film Controls window, click **Position >** to advance the film and determine the "average" low number on the right LED.

2. Subtract the average low number from the highest number you recorded in step 1 under *Recording the Highest Numbers on the LEDs.*

3. Divide the result of step 2 by 4.

4. Add the result of step 3 to the average low number determined in step 1.

   The result is the right trigger point. Record this number.

   Below are examples of determining trigger points. Round to the nearest whole number.

Average Low Number	*Starting High Number*	*Difference Between High Number and Low Number*	*Difference Divided by 4*	*Trigger Number*
120	800	800 - 120 = 680	680/4 = 170	170 + 120 = 290
98	814	814 - 98 = 716	716/4 = 179	179 + 98 = 277

Setting the Trigger Points at the Scanner

plastic cover
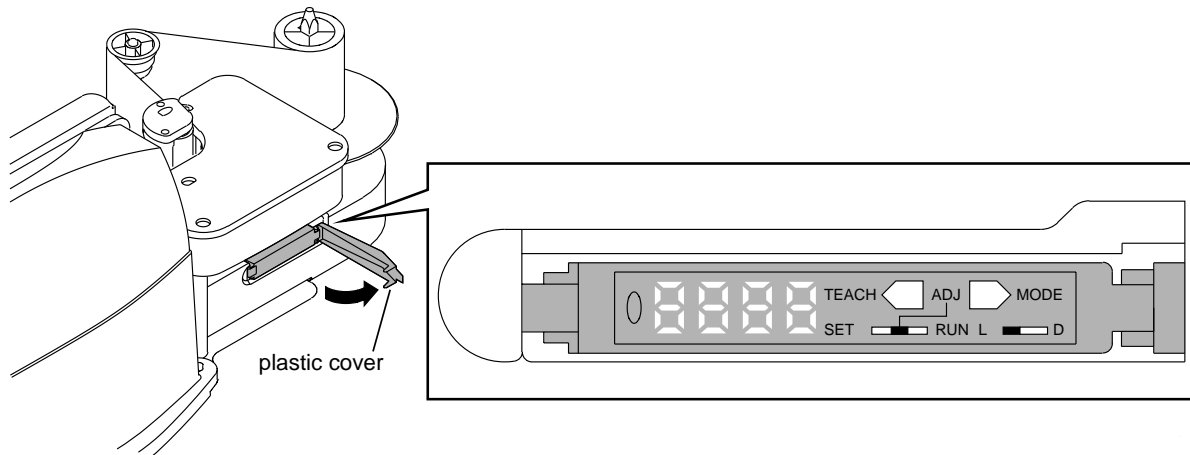
1. On the left side of the scanner:

   a. Move SET/ADJ/RUN to **ADJ**.

   b. Press **MODE** to increment the number (or press **TEACH** to decrement the number) to the value you determined to be the left trigger point.

   c. Move SET/ADJ/RUN to **RUN**.

2. On the right side of the scanner:

   a. Move SET/ADJ/RUN to **ADJ**.

   b. Press **MODE** to increment the number (or press **TEACH** to decrement the number) to the value you determined to be the right trigger point.

   c. Move SET/ADJ/RUN to **RUN**.

3. Close the plastic cover.

Appendix D-3: Maintenance

Perform these maintenance procedures at least once a day.

1. In SAM, select *View>Film Controls.*

2. Click **Tension Off** and remove film from the gate.

It is not necessary to completely unthread the film.

Cleaning the Punch Readers

1. Locate the two punch readers, below the pressure rollers and adjacent to the left and right edges of the aperture.
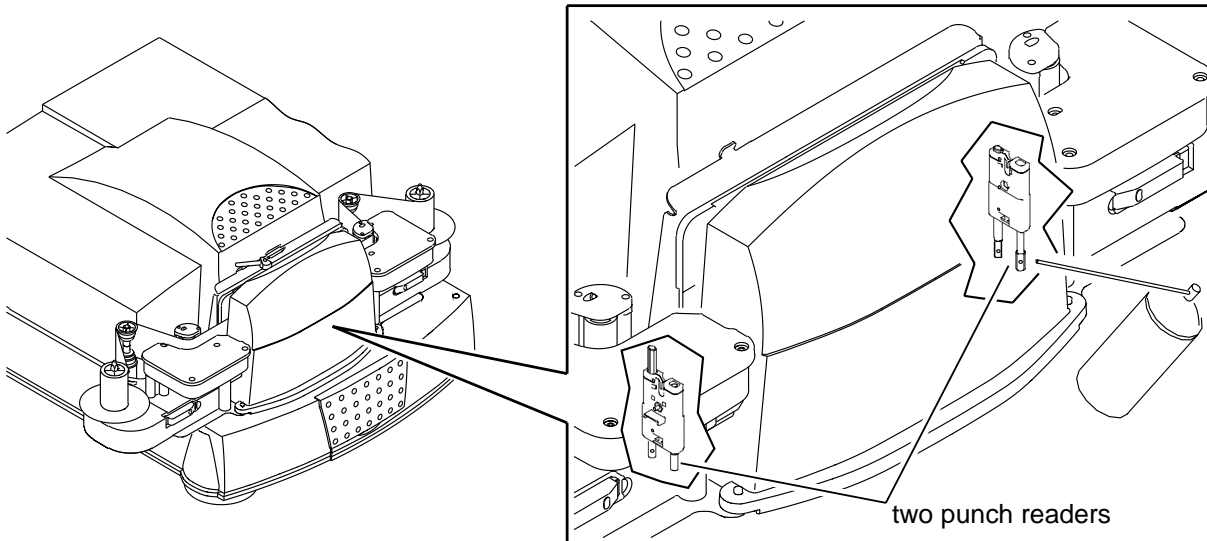
two punch readers

2. Use canned air to clean the left and right punch readers.

Cleaning the Rollers

1. In SAM, select *View>Film Controls.*

2. On the Film Controls window, click **Clean Rollers**.

A dialog box appears.

3. Make sure no film is in the gate. Click **Yes**.

The rollers rotate.

CAUTION: In the step below, do not use rubbing alcohol.

4. Using a lint-free cloth with 90% or higher isopropyl alcohol, wipe the exposed part of the moving rollers—in the slot at the rear of the housing—from top to bottom. Repeat until the cloth stays clean.
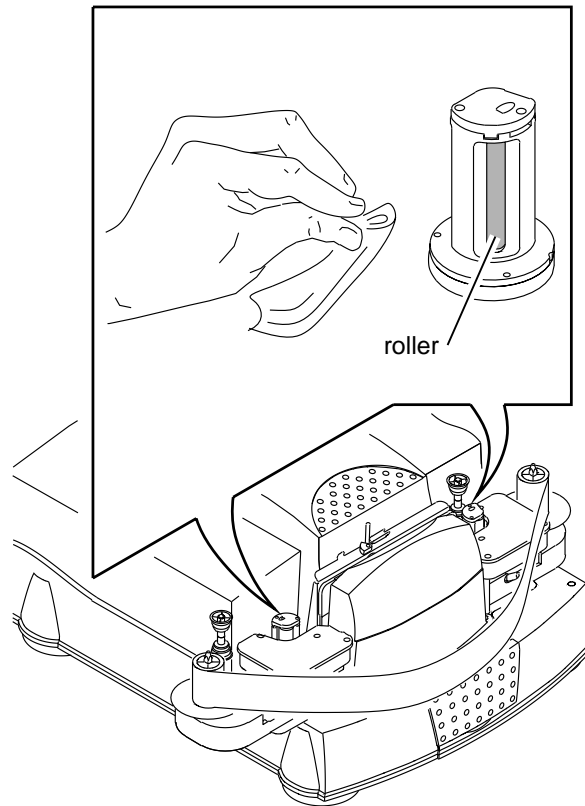
5. On the Film Controls window, click **Stop**.

Appendix D-4: Initial Setup of Sensors

IMPORTANT: Do this procedure only if you installed a new sensor or if the sensor setup was accidentally changed.

Resetting the Sensors to the Factory Values
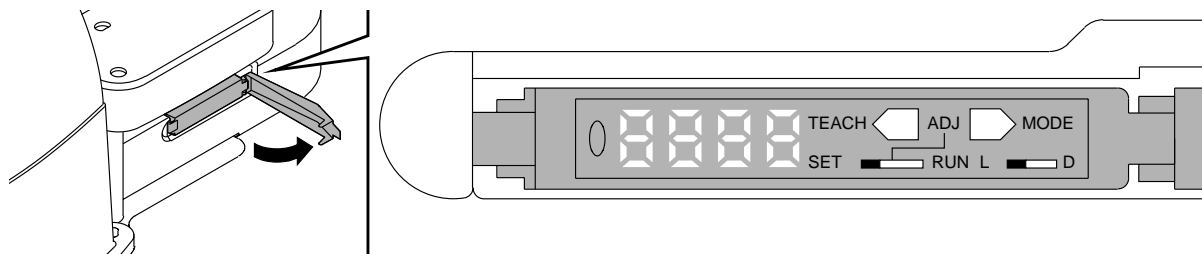
1. Move SET/ADJ/RUN to **SET**.

2. Simultaneously, press and hold **TEACH** and **MODE** until **nO ?** appears (about 5 seconds).
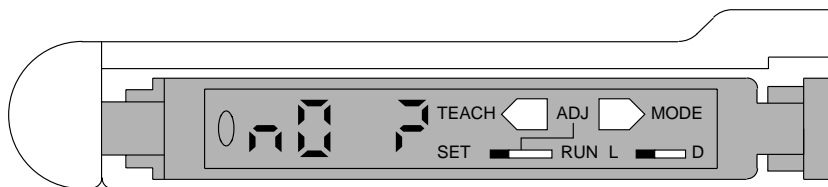
NOTE: To cancel resetting the sensors to the factory values, press **MODE**.

3. Press TEACH until **yES?** appears.
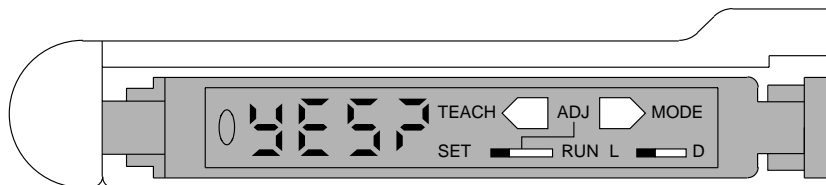
4. Press **MODE**.

5. Move SET/ADJ/RUN to **RUN**.

Programming the Sensors for the Long Roll Accessory

Power on the scanner.

The display on the left sensor will be inverted.

Programming the Left Sensor

1. Open the plastic cover on the left display.
2. Make sure the operation mode selector is set to **L**.

   NOTE: L means that light triggers high numbers. D means that dark triggers high numbers.

plastic cover

operation mode selector
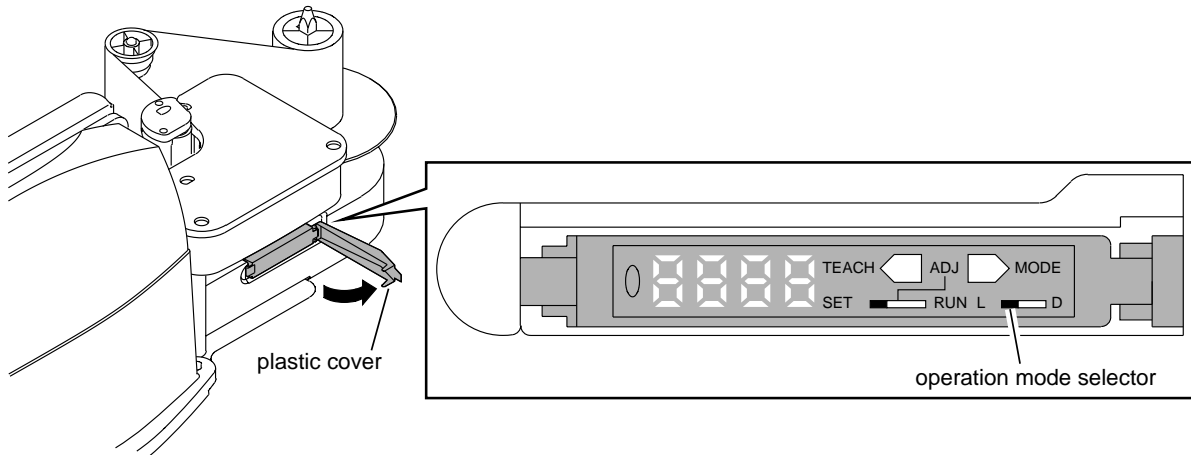
3. Move SET/ADJ/RUN to **SET**.
4. Press and hold **MODE** until **d123** appears (123 is inverted).
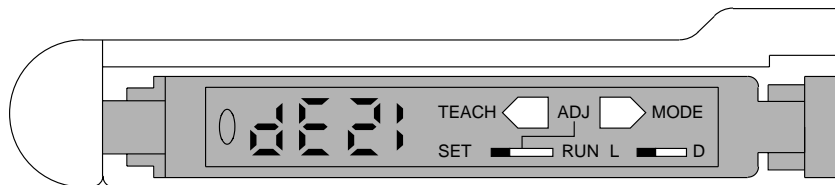
5. Press **TEACH**.

6. Change the Detection Function Setting to **F HS** (high speed):

   a. Press and hold **MODE** until **F St** appears.
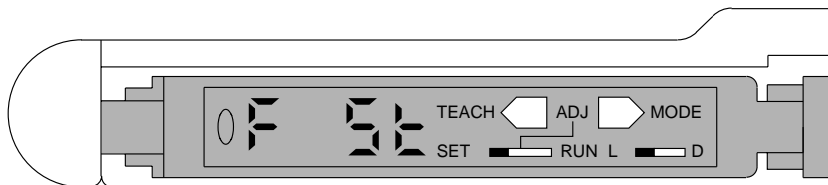
   b. Press **TEACH** once. **F Ld** appears.

   c. Press **TEACH** again. **F HS** appears.

   d. Move SET/ADJ/RUN to **RUN**.

Programming the Right Sensor

1. Open the plastic cover on the right display.

2. Make sure the operation mode selector is set to **L**.

3. Move SET/ADJ/RUN to **SET**.

4. Change the Detection Function Setting to **F HS**:

   a. Press and hold **MODE** until **F St** appears.

   b. Press **TEACH** once. **F Ld** appears.

   c. Press **TEACH** again. **F HS** appears.

   d. Move SET/ADJ/RUN to **RUN**.

Appendix D-5: Table of Scan Area Values

Use the table below only as a starting point for determining scan area values.
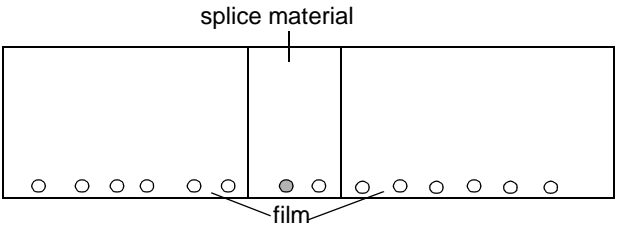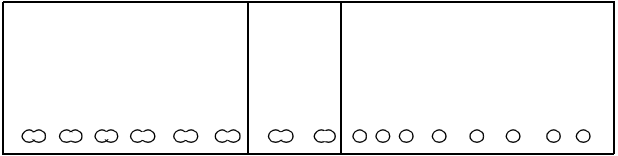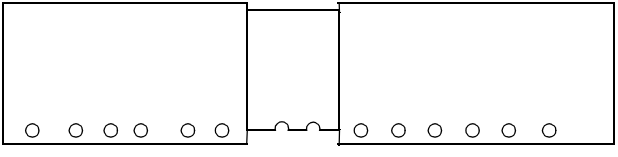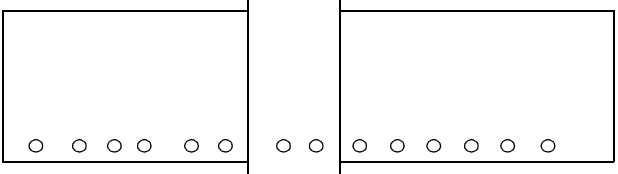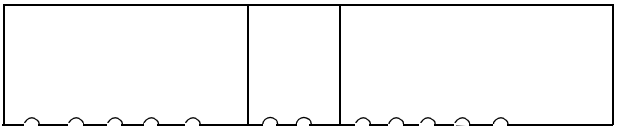
Long-Roll Film Holders	Magnification	# Pixels	Pixel Offset	# Lines	File Size (MB)
35 mm double-perforated	.50	1020	2490	1538	4.5
	1.03	2102	1949	3168	19.1
	2.00	4081	960	6151	71.8
35 mm unperforated	.50	1259	2371	1741	6.3
	1.03	2594	1703	3586	26.6
	2.00	5038	481	6964	100.4
46 mm	.50	1752	2124	2381	11.9
	.60	2102	1949	2858	17.2
	1.58	5535	233	7525	119.2
6 x 4.5 cm vertical	.50	2378	1811	1539	10.5
	.66	2616	1431	2031	18.2
	1.26	5993	4	3878	66.5
6 x 6 cm	.50	2378	1811	2250	15.3
	.55	2616	1692	2475	18.5
	1.26	5993	4	5670	97.2
6 x 7 cm	.50	2378	1811	2775	18.9
	1.26	5993	4	6994	119.9
6 x 9 cm	.50	2378	1811	3495	23.8
	1.16	5517	242	8108	128.0
Split 70 mm	.50	2720	1640	1632	12.7
	.63	3427	1287	2056	20.2
	1.10	5984	8	3591	61.5
70 mm	.50	2720	1640	3625	28.2
	1.06	5766	117	7685	126.8

Appendix D-6: Film Splicing and Editing Guidelines

Follow these guidelines to ensure the scanner correctly reads the data holes.

IMPORTANT: When splicing rolls of film, always splice first, then edit.

NOTE: The drawings are not to scale.

Use care with sticky splice material	Because the splice material is sticky, it is possible for residue to remain on the splice material after editing. Ensure that light can shine through all holes.	splice material
Avoid over-punching	Be careful to avoid accidentally punching a frame twice, which results in too many holes for the scanner to interpret.	
Cut splice material flush with the film	Too much splice material is cut, causing incomplete punches.	
	Not enough splice material is cut. This will interfere with correct film tracking.	
Make sure editing results in holes entirely within the frames	The punches are on the edge of the film. The punches must be completely within the frames.	

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